



Marine Mammal Protection Act Of 1972

Annual Report 1987/88

June 1988

**U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service**

Marine Mammal Protection Act of 1972 Annual Report

April 1, 1987 to June 30, 1988



U.S. DEPARTMENT OF COMMERCE

Robert Mosbacher, Secretary

National Oceanic and Atmospheric Administration

William E. Evans, Under Secretary

National Marine Fisheries Service

James W. Brennan, Assistant Administrator



THE SECRETARY OF COMMERCE
Washington, D.C. 20230

APR 24 1988

President of the Senate
Speaker of the House of Representatives

Dear Sirs:

I am pleased to submit the Annual Report of the Department of Commerce regarding the administration of the Marine Mammal Protection Act of 1972 for the period April 1, 1987 through June 30, 1988, as required by Section 103(f) of the Act.

The Department of Commerce is responsible for implementing the Act with respect to whales and porpoises of the order Cetacea and seals and sea lions of the suborder Pinnipedia. The report details the activities of the Department regarding these marine mammals.

Sincerely,

A handwritten signature in dark ink, appearing to read "R. Mosbacher", is written over the word "Sincerely,".

Robert A. Mosbacher

Enclosure

TABLE OF CONTENTS	Page
INTRODUCTION	1
SUMMARY	2
REAUTHORIZATION OF THE MMPA	4
MARINE MAMMALS AND COMMERCIAL FISHING	5
General Permits	5
Incidental Take of Marine Mammals in East Coast	
Joint-Venture Fishery	6
Incidental Take of Porpoise in the Yellowfin Tuna Fishery	7
Importing Yellowfin Tuna	9
Incidental Take of Dall's Porpoise in the	
Japanese Salmon Gillnet Fishery	9
MARINE MAMMALS AND THE FISHERY RESOURCE	11
Pacific Northwest	11
California	12
Alaska	12
Northeast	12
SUBISTENCE TAKE OF MARINE MAMMALS	13
Bowhead Whales in the Beaufort and Chukchi Seas	13
Northern Fur Seals on the Pribilof Islands	14
REQUEST FOR A SMALL TAKE OF BOWHEAD AND GRAY WHALES	15
PERMITS FOR PUBLIC DISPLAY AND SCIENTIFIC RESEARCH	16
WHALE WATCHING WORKSHOP	18
STRANDINGS OF MARINE MAMMALS	19
Stranding Workshop	19
Dolphin and Whale Strandings on the East Coast	19
Regional Networks	20

INTERNATIONAL PROGRAMS	22
International Whaling Commission	22
North Pacific Fur Seal Commission	23
International North Pacific Fisheries Commission	24
US-USSR Marine Mammal Project	24
Inter-American Tropical Tuna Commission	25
ENFORCEMENT OF THE MMPA	26
DEPLETED MARINE MAMMALS	27
Northern Fur Seal	27
Northern Sea Lion	27
Hawaiian Monk Seal	28
Bowhead Whale	29
Humpback Whale	30
Right Whale	31
Gray Whale	31
REPORTS ON SELECTED SPECIES	33
Bottlenose Dolphin	33
Beluga Whale	34
Atlantic Ocean-Multispecies Studies	34
LEGAL ACTIONS	35
APPENDIX	
Permit Tables	
Population Estimates	
Publications List	

FRONT COVER: Adult male northern fur seal on the Pribilof Islands, Alaska. Photo by Charles W. Fowler, National Marine Mammal Laboratory, National Marine Fisheries Service, Seattle, Washington.

BACK COVER: Three juvenile pilot whales rescued from a mass stranding recover in a pool at the New England Aquarium. Photo furnished by New England Aquarium, Boston, Mass.



Northern fur seals on the Pribilof Islands, Alaska. Photo by Charles W. Fowler, National Marine Mammal Laboratory, National Marine Fisheries Service, Seattle, Washington.

INTRODUCTION

Passage of the Marine Mammal Protection Act (MMPA or the Act) in 1972 committed the United States to long-term management and research programs to conserve and protect these animals. With few exceptions, the Act places a moratorium on taking or importing marine mammals or their products into the United States. It delegates authority and responsibility for oceanic marine mammals to the Secretary of the Agency where the National Oceanic and Atmospheric Administration (NOAA) operates. Species of the order Cetacea (whales and dolphins) and the order Carnivora, suborder Pinnipedia (seals and sea lions), are the responsibility of NOAA's National Marine Fisheries Service (NMFS). The Department of the Interior is responsible for the dugong, manatee, polar bear, sea otter, and walrus.

Marine mammals may be taken for scientific research, public display, and incidentally to commercial fishing. Under the MMPA, the term "take" means to hunt, capture, kill or harass, or to attempt these actions. In 1981, amendments to the Act added two categories of "small take" to the moratorium exception; one is for commercial fishing and the other applies to other activities such as oil and gas exploration. Also, certain natives of Alaska may take marine mammals for subsistence use and production of handicrafts.

NMFS grants or denies requests for exemptions, issues permits, carries out research and management programs, enforces the Act, participates in

international programs, and issues rules and regulations to carry out its mission to conserve and protect marine mammals. NMFS cooperates with the States, conservation organizations, industries, the public, other Federal agencies, the Marine Mammal Commission, and many constituent groups including scientific researchers and zoos and aquariums.

NMFS's marine mammal research programs are the responsibility of the National Marine Mammal Laboratory (NMML), Northwest and Alaska Fisheries Center, Seattle, Wash.; the Northeast Fisheries Center, Woods Hole, Mass.; the Southeast Fisheries Center, Miami, Fla.; and the Southwest Fisheries Center, La Jolla, Calif.

Management programs are the responsibility of the Alaska Region, Juneau, Alaska; the Northeast Region, Gloucester, Mass.; the Northwest Region, Seattle, Wash.; the Southeast Region, St. Petersburg, Fla.; and the Southwest Region, Terminal Island, Calif. Research and management programs are coordinated by the Office of Protected Resources in NMFS Headquarters, Washington, D.C., Dr. Nancy Foster, Director.

This Annual Report to Congress is available from the Office of Protected Resources, National Marine Fisheries Service, Silver Spring, MD 20910. For further information, contact Margaret Lorenz, Protected Species Management Division, (301) 427-2322.

SUMMARY

Both the Senate and the House of Representatives held hearings in 1988 to consider reauthorization of the MMPA. A Working Group made up of representatives from the NMFS Regions and Centers identified issues that needed to be addressed and recommended amendments that would improve the Service's ability to manage and protect marine mammals. The Working Group addressed what many consider the most important issue to be resolved...the restriction on taking marine mammals that are depleted. A species below its optimum sustainable population (OSP) is considered depleted, and the Act prohibits taking these species incidentally to commercial fishing operations. If the status of a population cannot be determined, that population is treated as if it were depleted.

Since the General Permits that allow a take of marine mammals incidentally to commercial fishing expire at the end of 1988, NMFS is preparing an environmental impact statement on the issuance of new permits. However, NMFS does not have the information it needs to determine the status of all marine mammals involved in the fishery and some species that are considered depleted, such as fur seals, are taken in small numbers in these fisheries. Therefore, NMFS, along with the Marine Mammal Commission and a cooperative group formed by a coalition of fishing industry representatives and conservation groups, has been working with the Congress to allow commercial fishing to continue without adverse affects to any population of marine mammal.

In 1984, the Congress amended the MMPA to extend the General Permit held by the American Tunaboat Association and to continue allowing up to 20,500 dolphins to be taken incidentally to

the purse seine fishery for yellowfin tuna in the eastern tropical Pacific. This allows the fishery to continue, even though some of the dolphin stocks may be depleted, while NMFS undertakes a 5-year assessment of the affected dolphin stocks. This assessment, which has been underway since 1986, will determine whether the stocks of dolphins taken by both the foreign and domestic tuna fishery are increasing, decreasing, or stable.

Although the take of dolphins by the U.S. purse seine fleet has decreased dramatically, the take by foreign fleets has continued to be extremely high. Based on amendments made by the Congress to address this concern, NMFS published proposed regulations in April, 1988, that govern the importation of yellowfin tuna that is caught in association with dolphins. Foreign nations that purse seine for tuna in the eastern tropical Pacific and wish to export the tuna to the United States must prove that they have a comprehensive set of laws and regulations designed to protect dolphins.

The number of marine mammals killed in connection with commercial fisheries was in large part responsible for Congress passing legislation to protect these species. However, when marine mammals come into contact with fishermen and damage their gear and the fishery resource itself, the MMPA does not specifically address a way to resolve this conflict. While the MMPA authorizes taking marine mammals for their own protection and welfare and for the protection of public health and welfare, and the non-lethal removal of nuisance animals, it is not clear when these provisions apply. The most well-known conflict that NMFS is attempting to resolve is the problem of sea lions eating a wild run of winter steelhead as they attempt to enter the fishway at Lake Washington. Although some methods were ef-

fective at first, none have been completely successful in keeping the sea lions from eating the fish at the ladder.

In 1986, the MMPA was amended to allow a "small incidental take" of depleted marine mammals for activities other than commercial fishing. Before this amendment, only non-depleted marine mammals could be taken. The first request for a take of depleted species has come from a group of oil companies requesting a small take of bowhead and gray whales incidentally to energy exploration activities in the Chukchi and Beaufort Seas.

One of the most visible programs authorized by the MMPA, the scientific research and public display permit program, is undergoing an extensive review. After 15 years of operation, NMFS is reviewing the policy, criteria and procedures used to evaluate applications and to issue and monitor permits. This review which is being conducted in consultation with the scientific community, the public display industry, environmental organizations and other interested groups should result in a more efficient program that is more responsive to the concerns of applicants and the needs of marine mammals.

NMFS will address another concern at a Whale Watching Workshop this fall (1988) in Monterey, Calif. There is a growing whale watching industry on the East and West Coasts and in Alaska and Hawaii, and NMFS is concerned about its effects on whale populations. The results of the workshop, which is jointly sponsored by NMFS and the Center for Environmental Education, will be used to assist NMFS in developing a national policy and action plan.

Two unusual stranding episodes that happened along the East Coast in 1987 tested the strength of NMFS' Regional Stranding Networks. One stranding episode involved bottlenose dolphins from New Jersey to Georgia. By the end of the epidemic, over 740 dolphins were found dead. To investigate, NMFS formed the Atlantic Bottlenose Dolphin Response Team which included members of local, State and Federal Government agencies as well as those from local marine

aquaria, academia, and the environmental community. Pathological examinations show that the dolphins died from massive bacterial infections, but it is not known why the dolphins were vulnerable to these infections. NMFS continues to investigate this epidemic. The second stranding episode concerned the death of 42 whales in the vicinity of Cape Cod. NMFS believes that the whales died from biotoxins ingested when they were feeding on mackerel which have large amounts of the biotoxin in their internal organs.

In June 1988, NMFS designated the Pribilof Island population of North Pacific fur seals as depleted, and it is considering whether to designate the northern (Steller) sea lion as depleted. Other species already designated depleted under the MMPA include the Hawaiian monk seal, the bowhead whale, spotted dolphin (coastal spotted stock) and the spinner dolphin (Eastern spinner stock). Marine mammals listed as threatened or endangered under the Endangered Species Act of 1973, are, by definition, depleted species. They are the Gulf of California harbor porpoise, blue whale, bowhead whale, fin whale, gray whale, humpback whale, right whale, sei whale, sperm whale, Caribbean monk seal, Guadalupe fur seal, Hawaiian monk seal and Mediterranean monk seal.

The United States participates in international programs that further the protection of marine mammals, and it is an active participant in the International Whaling Commission (IWC). The IWC sets the quota for the number of bowhead whales that can be taken by Alaska natives for cultural, traditional and subsistence uses. It also considers requests for scientific research permits by its member countries; most requests are from nations that were involved in commercial whaling before the IWC voted a moratorium on commercial whaling in 1982.

Enforcement of the MMPA is the responsibility of NMFS enforcement agents with the support of several State enforcement officers. Most violations involve the unlawful taking, including harassment, of marine mammals. Next is the unlawful importation of marine mammal parts and products.

REAUTHORIZATION OF THE MMPA

The U.S. Congress held hearings in April and May of 1988 to consider reauthorization of the MMPA. Much of the testimony presented by NMFS was based on a report of the NMFS Working Group on Reauthorization.

The Deputy Assistant Administrator for Fisheries, NOAA, testified, "We have made significant progress, but there are still a number of challenges in meeting the objectives of the Act. There are increasing numbers of interactions between marine mammal populations and human activities. These interactions are having serious effects on people, marine mammals and other marine resources. Marine mammals are being entangled in fishing gear, injured in collisions with boats, and sometimes illegally killed. People and businesses are being affected by damage to fishing gear and reductions of catch of fisheries resources. To give you an idea of how large the problem is, incidental taking associated with fisheries in U.S. waters involves over 20 species and 10,000 marine mammals. It is becoming more and more difficult to manage the taking of these marine mammals so as to allow the 3-billion pound American fisheries to continue. Our greatest challenge is to develop effective management strategies to deal with these interactions while keeping adverse effects on both the marine mammals and marine user groups to a minimum."

The most critical issue addressed at the hearings was the restriction on taking species determined to be depleted. A species below its optimum sustainable population (OSP) is considered depleted, and the Act prohibits taking these species incidental to commercial fishing operations. Further, if a population's status relative to OSP cannot be determined, it is treated as if it were depleted.

Under the current definition and interpretation of OSP, determining the status of populations relative to their OSP is difficult and expensive. Because of this, OSP determinations have been made for only a few species. Of several options considered, the working group recommended that NMFS propose an amendment to the MMPA to allow a limited take of depleted species incidental to commercial fishing if the taking occurs at a level that allows for population growth and if mortality rates and trends in abundance are monitored. The extent of the management program required would be based on the level of take and the status of the species involved.

However, the fishing industry and the conservation community, recognizing the seriousness of the problem, formed a working group to develop a solution that could be supported by all parties. This group developed a proposal that would allow commercial fisheries to continue under a 3-year limited exemption while providing documentation on the nature and extent of interactions between commercial fishing and marine mammals. NMFS testified that such cooperative efforts between government, industry and the conservation community are the best way to reach reasonable resolutions to these problems. The Congress is considering amendments to the MMPA to address commercial fishing incidental take problems.

Another issue is the problem of removing marine mammals, usually seals or sea lions, that interfere or in some way come into conflict with other marine resources. For example, a number of California sea lions position themselves in an area where migrating salmon gather in Puget Sound before entering a fish ladder to Lake Washington. These few sea lions have almost decimated a

depleted run of steelhead trout. Efforts to alleviate this problem have failed. However, NMFS, the fishing industry and the conservation community are working together to determine what, if any, additional authorities are needed to deal adequately with nuisance animals.

The NMFS Working Group believed that many other issues identified in the report can be addressed without amendments. For example, problems with the Regional Stranding Network or with definitions of terms such as "harassment" and "take" may be resolved by NMFS reviewing its current activities or interpretations and possibly issuing guidelines or regulations for clarification.

MARINE MAMMALS AND COMMERCIAL FISHING

General Permits

Domestic. Under the MMPA, marine mammals are allowed to be taken incidentally to commercial fishing operations. This take of animals is governed by guidelines, regulations, monitoring, and reporting. General Permits that allow a take are issued to domestic and foreign commercial fishing associations.

The nine general permits that NMFS has issued to domestic fishing groups will expire at the end of 1988. Before NMFS can consider applications to renew these permits, it must determine the status of each species to be taken and determine the impact of the proposed level of take on each species.

To make these determinations, NMFS is preparing a Draft Environmental Impact Statement (DEIS) on the Interactions Between Marine Mammals and Commercial Fisheries within the U.S. Exclusive Economic Zone. Scoping meetings have been held in San Francisco, Calif. and Washington, D.C. NMFS will report on the status of marine mammals taken incidentally in commercial fisheries and publish a Final Environmental Impact Statement by December 1988.

Foreign. General permits are issued to foreign fishing associations or embassies whose governments have a governing international fishery agreement (GIFA) with the United States allowing them to fish in the U.S. exclusive economic zone (EEZ). Table I in the Appendix lists countries with permits.

Small Take Exemptions. A 1981 amendment to the MMPA allows an incidental, but not intentional, taking of small numbers of nondepleted species or stocks of marine mammals by U.S. citizens engaged in commercial fishing operations. This exemption to the general permit requirements of the Act can be granted only if the total taking will have a negligible impact on the species or stocks involved and if a system to monitor and report any taking has been established among the fishermen involved. An OSP determination does not have to be made for the marine mammals that are taken under this "small take" exemption. These exemptions apply only to domestic fishing operations.

Exemptions have been granted for a small take of marine mammals to the National Fish Meal and Oil Association, which includes owners and operators of U.S. menhaden vessels in the Atlantic Ocean, and to New England Groundfish Gillnetters.

Incidental Take Of Marine Mammals In East Coast Joint-venture Fishery

An unusually high number (179) of marine mammals were taken incidentally to the 1988 East Coast joint-venture fishery for mackerel. Four species of marine mammals were taken: 141 common dolphins, 28 pilot whales, 8 white-sided dolphins and 2 bottlenose dolphins. None of the countries involved (East Germany, Poland, the Netherlands and the United States) had General

Permits that would allow an incidental take of marine mammals. The first marine mammal was taken December 25, 1987, and the last May 4, 1988. On May 3 and 4, 1988, the Northeast Region sent notices explaining the penalties of catching marine mammals without permits. However, both the Netherlands and Polish vessels left the EEZ before receiving the notifications and the East Germans left a few days after being notified.

NMFS observers were on aboard all foreign vessels throughout the season and reported the violations. NMFS did not issue incidental take permits for 1988 because NMFS believes that it is not authorized to issue a permit allowing the capture of any marine mammal if the agency knows that the permitted activity involves the taking of other species of marine mammals for which a permit cannot be issued. The agency views this as any marine mammal for which an OSP statement has not been made. The United States was responsible for 4 percent of the take, East Germany - 23 percent, the Netherlands-31 percent and Poland-42 percent.

Incidental Take of Porpoise in the Yellowfin Tuna Fishery

Although considerable progress has been made in reducing the number of porpoise killed each year in the purse-seine fishery for yellowfin tuna in the eastern tropical Pacific, NMFS continues to commit its resources to reduce further this incidental take of marine mammals. In 1987, the estimated mortality of porpoise in the U.S. yellowfin tuna fishery was 13,992.

Congress amended the MMPA in 1984 to extend the general permit held by the American Tunaboat Association and to continue the quota on the taking of porpoise of 20,500 per year in the eastern tropical pacific (ETP). This allows the U.S. tuna fleet to continue fishing for yellowfin tuna in association with dolphin stocks even though some of these stocks may be depleted. The 1984 amendments also require NMFS to undertake a 5-year assessment of the affected porpoise

stocks. This assessment has been underway since 1986. Besides using data collected on research vessels, NMFS is developing methods to use information collected by observers on tuna vessels to monitor changes in the relative abundance of the stocks. In 1992, NMFS will determine whether the stocks of porpoise affected by the multinational tuna fishery are increasing, decreasing, or stable.

Table 1. Incidental Take Levels from 1983-1987 (Kill per ton)

Year	US Vessels	Non-US Vessels	Total
1983	8,513	Unknown	Unknown
1984	17,732	15,018	32,750
1985	19,205	36,032	55,297
1986	20,692	103,095	124,597
1987	13,992	78,497	92,489

Management. NMFS places observers aboard tuna seiners to collect scientific data and to monitor the incidental take of porpoises and methods used by the fishermen to avoid a take. To validate NMFS's mortality estimation methodology, observers were placed on board nearly 100 percent (123 cruises) of the 1987 fishing trips that involved U.S. purse seiners. This was the greatest number of cruises observed in the history of the program; 44 were sponsored through the dolphin/tuna research program of the Inter-American Tropical Tuna Commission (IATTC) and 79 were sponsored by NMFS.

Tuna sciner operator's workshops were held for eight skippers in 1987. Certificates of Inclusion were issued to 74 operators and 34 vessel owners. Net and gear inspections to ensure the presence of required porpoise safety gear were completed for three vessels that were in port. Additionally, observers conducted 78 preliminary gear inspections at sea.

Research. NMFS' monitoring program uses data collected by observers on research vessels and U.S. tuna vessels. Surveys have been designed to detect an annual change in relative abundance as small as 10 percent per year for spotted dol-

phins. The experimental design involves two vessels transecting the study area for 120 days each year for a minimum of 5 years (6 surveys). In 1986, the first survey was completed by two NOAA research vessels, the *David Starr Jordan* and the *McArthur*, serving as sighting platforms for observers from late July through early December. A data report for each vessel, which summarizes effort and sighting completed during the cruise, is available from the NMFS Southwest Fisheries Center, P.O. Box 271, La Jolla, CA 92038.

A report covering abundance estimates of all stocks and species will be available for review in September 1988. Because the northern offshore spotted dolphin is the stock most affected by the fishery, only abundance estimates for that stock are presented for several data treatment options in this report. The estimates of population size for northern offshore spotted dolphins, using one option, were 1,543,000 and 891,500 animals for data incorporating dolphin schools of all sizes and for data using only dolphin schools containing at least 15 animals (hereafter referred to as large schools), respectively. The large difference between the two estimates was because the estimate of school density for all schools was 7.13 schools/1000 km² versus 2.76 schools/1000 km² for large schools.

From late July through early December, 1987, NMFS completed the second survey. The same vessels were used to traverse similar tracklines. During the survey, 1,240 marine mammal schools consisting of approximately 54,859 animals were detected. Of these, 926 were dolphin schools. This year a helicopter was added to the NOAA ship *David Starr Jordan* to obtain aerial photographs of schools sighted during the dolphin monitoring cruises. Aerial photographs are being used to calibrate estimates of school size that are made by the usual teams of shipboard observers. Counts made for a series of overlapping photographs give a much more precise estimate of school size than can be made from the deck of a rolling ship.

Imagery collected from this first year has already demonstrated the advantage of this approach. Despite bad weather, more than 100 schools of dolphins and other small cetaceans were

photographed, and about one-third of these appear suitable for calibrating ship-board estimates of school size. In addition to school size estimation, some of the better images can be used to obtain length measurements. By knowing the length distribution of a large sample, it may be possible to measure the recruitment rate of young animals into the population.

In addition, scientists collected information on the physical and biological environment of these animals. The physical oceanography of the area is being investigated jointly with scientists from NOAA's Eastern Pacific Ocean-Climate Studies program. The oceanographic data are being used to monitor the patterns and variability of the habitat and to interpret the observed dolphin distributions and trends in the dolphin populations.

Also, NMFS is developing methods to use information collected by observers on tuna vessels to monitor changes in the relative abundance of ETP dolphins. This approach uses dolphin sightings and life history data along with ship operations data which are collected by observers. Because it is not possible to control the sampling regime of the tuna vessels, assumptions and techniques applicable in standard data analyses may not be suitable for data collected by tuna vessel observers.

Since 1968, scientific observers aboard tuna vessels have collected information on the biology of the dolphins killed incidental to fishing. Information includes length, sex, age, and reproductive condition. Teeth are collected for ageing and, if current studies develop, for providing a history of past environmental stress. Gonadal tissues are collected to determine reproductive parameters. Understanding gained from analyses of these data help to determine the reproductive capacity of impacted dolphin populations as well as to identify potential compensatory mechanisms operating to maintain optimal size.

Because there is more than one population (or stock) of each affected species in the ETP, it is necessary to determine the impact of the fishery on specific dolphin populations. Therefore, sufficient data must be collected to examine how the

various life history parameters may change between areas and over time. Areas will be defined by fishing effort in order to investigate the effects of chase and capture on reproductive and other life history parameters.

Using the log book data of the U.S. and international tuna fleets from 1959 through 1985, the growth and expansion of the fishery is being examined by investigating the number of sets per one-degree square. Kill-per-set is also being examined as a potential index of fishing pressure. Preliminary evidence suggests there are changes in various biological factors from the eastern tropical Pacific that can be correlated with changes in fishing pressure.

Factors being considered to evaluate the relationship between fishing pressure and its concomitant stress and other reproductive and growth rate parameters include body condition, annual pregnancy rate, lactation period, calving interval, age at sexual maturation, and periodic episodes of calcium resorption recorded in dental layers. Work is also underway to examine interchange between stocks of spinner dolphins.

Importing Yellowfin Tuna

Due to concern over porpoise mortality in the foreign fishery for yellowfin tuna, the Congress amended the MMPA and required NMFS to publish regulations governing the import of yellowfin tuna. These proposed regulations which were published in April 1988 provide for an observer program to monitor and report porpoise mortality, an annual certification program to assure compliance with U.S. requirements in order to continue exporting tuna to U.S. markets, and a comparability test that distinguishes variability in performance between small and large fleets of foreign nations.

Specifically, foreign nations purse seining in the ETP and wishing to export yellowfin tuna to the U.S. must prove that they have a comprehensive set of laws and regulations designed to protect porpoise. Their regulations and porpoise saving

gear must be comparable to those of the U.S. In addition, each nation must submit observer data collected on porpoise mortality. Starting next year (1989), annual mortality rates must show significant improvement to remain "comparable". This improving trend in mortality must continue and by 1991 must be no greater than 25 percent above the U.S. rate for nations with large fleets or 75 percent for nations with smaller ones.

Incidental Take of Dall's Porpoise in the Japanese Salmon Gillnet Fishery

Dall's porpoise are taken incidentally in the Japanese salmon gillnet fishery within and outside of the U.S. Exclusive Economic Zone (EEZ) in the North Pacific Ocean and Bering Sea. Until 1987, the fishery was allowed to take up to 5,500 porpoise each year. In 1987, NMFS issued Japan a new general permit that allowed a taking of about 6,000 Dall's porpoise during a 3-year period based on a determination that the stocks would not be disadvantaged. The 1987 fishing season was completed before a Court-ordered injunction concerning the new permit went into effect. Based on a recent Court decision (See Legal Section), the Dall's porpoise permit has been ruled invalid since species that are not at OSP, such as the fur seal, would also be taken.

Research. NMFS studies the Dall's porpoise to determine the incidental take of marine mammals by Japanese salmon mothership and high seas squid driftnet fisheries, collects biological specimens from marine mammals incidentally taken collects sighting data, and conducts behavioral studies.

Incidental take: The U.S. monitoring program was modified to improve the accuracy of the estimates of incidental take of Dall's porpoise in the EEZ with six observers in each of three mothership fleets. A total of 303 gillnet sets (11 percent)

were monitored between June 12 and July 12. The estimated take inside the U.S. EEZ was 741 Dall's porpoise. In addition, 43 Dall's porpoise were taken south of the EEZ and 82 north of the Aleutians in the Bering Sea. The take rate was smaller than in previous years. One northern fur seal was taken and released alive and 8 were momentarily caught near the fishing vessels and released. One dead harbor porpoise was returned to the mothership.

Modified gillnets incorporating 3 strands of hollow tubes or multifilament material were used by the fishery. Observer data did not show a significant difference in take rates for the two types of gear.

Four cooperative research cruises on foreign vessels were conducted in the squid fishing area during the 1986 and 1987 fishing season. During the 1986 cruises, 1,485 km of gillnet were fished (equivalent to 99 salmon gillnet sets) and 9 Dall's porpoise (take rate of 0.09 porpoise per 15 km of salmon commercial gillnet), 16 northern fur seals (0.16 seals per 15 km), 8 Pacific white-sided dolphins (0.08 per 15 km) and 43 northern right whale dolphins (0.43 per 15 km) and 1 striped dolphin were taken incidentally.

Collection of biological material: Samples were collected from 348 Dall's porpoise incidentally taken by the Japanese salmon mothership fleets. Additional samples were collected on research vessels and from stranded animals off Washington. The reproductive samples have been examined and a report is being prepared for the International North Pacific Fisheries Commission.

Collection of sighting data: Data were collected from Japanese salmon catcherboats and research vessels and U.S., Korean and Taiwanese research vessels. Sighting data of marine mammals in the high-seas squid driftnet fishing area were collected from the NOAA ship *R/V Miller Freeman* in October. Dall's porpoise and northern fur seals were the most frequently sighted marine mammals. Marine bird and debris sightings data were also collected. In addition, oceanographic and prey resource data were collected to relate marine mammal distribution to oceanographic conditions and prey abundance.

Behavioral Studies: Behavior and movements of Dall's porpoise were monitored year round in Puget Sound, Wash. Sightings were most abundant in June when recently born calves were present.

MARINE MAMMALS AND THE FISHERY RESOURCE

An increase in the numbers of marine mammals, primarily seals and sea lions on the West Coast, has resulted in more cases of marine mammals coming into contact with fishermen, their gear, and the fishery resource itself. At times, this has resulted in significant losses of these resources and in adverse effects on catches of fish and fishing gear. On the other hand, marine mammals are killed, injured or harassed during some fishing operations.

The MMPA authorizes taking marine mammals for their own protection and welfare and for the protection of public health and welfare, and the non-lethal removal of nuisance animals. These authorities have been used as the basis for operation of the Regional Marine Mammal Stranding Networks and the removal of "nuisance" animals at fishways. However, it is not clear when the "nuisance" and "protection of public health and welfare" provisions apply.

In commercial fishery situations, other authorizations (Certificates of Inclusion) apply. A commercial fisherman with a Certificate of Inclusion can harass an animal when it is directly interacting with his gear or catch, but he cannot chase an animal out of the area to preclude further conflicts. However, since general permits do not apply to recreational fisheries, a sport fisherman cannot harass an animal that is stealing or attempting to steal his catch.

The following regional examples document these interactions as well as the steps NMFS is taking to resolve this issue.

PACIFIC NORTHWEST

One of the most well known conflicts is the "Herschel Problem" at the Hiram M. Chittenden Locks in Seattle where a small number of California sea lions are taking a wild run of winter steelhead as the fish attempt to enter the fishway into Lake Washington. For three years, an inter-agency group that includes NMFS, the Washington Department of Wildlife, the Army Corps of Engineers, and the Muckleshoot and Suquamish Indian Tribes has tried to resolve the problem using non-lethal methods of harassment. Although initially effective, overall these methods have not been completely successful. Other unsuccessful efforts have included conditioning the sea lions to avoid steelhead by applying taste aversion techniques and attempting to capture and transport the animals back to their breeding range off southern California. Although over 1,000 California sea lions occur in Puget Sound, the "Herschel Problem" currently involves about 12 animals that repeatedly return to prey on steelhead in spite of harassment. Earlier this year, an experimental, temporary, net barrier was installed in the spillway area at the Locks to assess the feasibility of a "sea lion barrier" as a partial solution to the problem.

Fishery conflicts with pinnipeds have been reported from all of the Northwest fisheries. There are increasing problems in all salmonid fisheries resulting in damage or loss of catch and gear, loss of fishing time, and in some cases, the need to modify normal fishing procedures where pinnipeds are present. This conflict is most severe in the salmonid net fisheries. Marine mammal-fisheries interactions were documented in 62 percent of the salmon gillnet fishing trips sampled in

the Columbia River in the early 80's. Pinniped interactions resulted in gear damage, fish loss or damage, and incidental takes in 36 percent of all of the fishing trips sampled.

CALIFORNIA

To assess this conflict in California, NMFS has awarded funds to the California Department of Fish and Game since 1979 to investigate interactions between marine mammals and fishing operations.

The Southwest Region recently published a report of the State's estimates of the incidental mortality of harbor porpoise in fisheries using set nets and of all marine mammals in fisheries using drift nets. Reports will soon be available on the incidental take of harbor porpoise, harbor seals, and California sea lions in the shark/swordfish drift gill-net fishery and all other gillnet fisheries. Current research includes observing the incidental take in several gill net fisheries and determining fishing areas and levels of fishing effects.

Marine mammals, especially California sea lions, interact frequently with sport fisheries. In response to a petition, NMFS issued regulations that authorize commercial passenger fishing vessels to harass marine mammals interacting with their passenger's catch. In June, 1986, NMFS issued a General Permit to the Sportfishing Association of California authorizing use of various devices for the non-lethal, non-injurious harassment of California sea lions in waters south of Piedras Blancas, California. In 1987, the SWR reviewed the certification program and concluded that due to the low number of reported interactions it was not possible to evaluate the effectiveness of the recently developed mechanisms. Since the program does not appear to affect sea lions adversely, NMFS will continue the program through 1988 to provide additional time to assess its effectiveness.

ALASKA

In 1985, longline fishermen for blackcod (sablefish) in Prince William Sound began reporting large losses to killer whales (the fish were

being stripped off as the lines were retrieved). In retaliation, fishermen began shooting at the whales and using large explosive charges to drive them away. In response, NMFS modified the fishermen's general permits and did not allow them to use explosives other than seal bombs or cracker shells.

During 1985 and 1986, several whales with bullet wounds were sighted in Prince William Sound. All appeared to belong to a single large resident pod of about 30 individuals. Although no dead animals were found, the number of animals reported missing from this pod were much higher than usually found in killer whale pods in the Sound (3 in 1985, 3 in 1986, and 1 in 1987). However, in 1987, no missing or injured killer whales were reported and complaints by fishermen diminished. The reason for this change is not known although NMFS has received reports indicating that fishermen may have tried a variety of non-lethal methods to avoid or to dissuade the whales. However, problems are continuing in the Bering Sea, and it is the main target for current research and monitoring efforts.

NORTHEAST

NMFS has received complaints about harbor seals eating and damaging salmon in the estuaries along the Northeast Coast. There is concern that any additional loss of adult salmon from seal predation will jeopardize salmon restoration efforts.

In East Coast offshore fleet-fishing operations, foreign fishery compliance inspectors are monitoring and recording all incidental takes of marine mammals. Pilot whales and common dolphins are the principal species taken in the Atlantic mackerel and squid fisheries (See Section on Incidental Take of Marine Mammals in East Coast Joint-Venture Fishery). When feasible, all incidentally taken non-endangered animals are frozen for processing by the Smithsonian Institution. These specimens are providing new information on the food habits, morphometrics, reproductive biology, physiology and parasitology of offshore cetaceans.

SUBSISTENCE TAKE OF MARINE MAMMALS

Bowhead Whales in the Beaufort and Chukchi Seas

Although bowhead whales are listed as an endangered species, Alaska natives are allowed to hunt them for subsistence purposes. Catch limits for the hunt are set by the International Whaling Commission and regulations for management of the harvest are implemented under the Whaling Convention Act of 1949. Both the MMPA and the Endangered Species Act provide for a subsistence take of endangered and depleted species by Alaska natives.

The quota for 1987 was 32 strikes. Twenty-two of the animals struck were landed and 9 were lost. At the 39th IWC meeting, it was agreed by consensus that there would be a strike limit of 35 animals in 1988.

NMFS is the Federal agency with primary responsibility for bowhead whales, but several other agencies including the State of Alaska, the Alaska Eskimo Whaling Commission, the North Slope Borough and the Minerals Management Service are involved. Each year, NMFS' Alaska Region staff participates in monitoring the fall bowhead migration as the animals pass through areas of oil activity in the Beaufort Sea. Studies of population size and recruitment, seasonal distribution and migration, and behavior relative to the availability of food or human disturbance, are carried out by NMFS and the North Slope Borough, a group representing Alaska natives.

Table 2. Annual Quotas and Catch of Bowhead Whales 1978-1988

Year	Quota ¹		Actual Take		
	Landed	Strikes	Landed	Lost	Strikes
1978	14	20	12	6	18
1979	18	27	12	15	27
1980	18	26	16	18	34
1981 ²	17	32	17	11	28
1983	18	18	9	9	18
1984	--	27 ³	12	13	25
1985	--	18	11	6	17
1986 ⁴	--	32	20	8	28
1987	--	32	22	9	31
1988	--	35	--	--	--

¹ Quotas were first set for this population in 1978. Since 1982, a landed whale counts against the strike quota. Hunting is to cease when the quota of total strikes, including landed whales is reached.

² Based on IWC quotas, totals for 1981, 1982, 1983 combined could not exceed 45 landed or 65 struck.

³ A two-year quota (for 1984-85) not to exceed 43 strikes was put into effect at July 1983 IWC meeting. A domestic limit of 27 strikes was set for 1984 consistent with the IWC decision. Of these, 25 strikes were used in 1987 allowing a possible total of 18 strikes in 1985.

⁴ The strike limit for 1986 (set at the IWC meeting in 1985) was 26 strikes; however, those strikes not used in 1985 could be added to the 1986 limit so long as the total number of strikes did not exceed 32. Because the total number of whales which could be struck in 1985 was raised from 18 to 26 at the 1985 IWC meeting, and because only

to 26 at the 1985 IWC meeting, and because only 17 whales were struck in 1985, the full 32 strikes were available in 1986.

Northern Fur Seals on the Pribilof Islands

NMFS issued final regulations in 1986 that govern the subsistence harvesting of fur seals by

residents of the Pribilof Islands in Alaska. Before the commercial harvest of fur seals ended in 1984, residents kept a certain portion of the commercial take for their own dietary requirements. In 1987 on St. Paul Island, 1,710 fur seals were taken for subsistence; most were 2 to 3 years old. On St. George Island, 92 fur seals were taken. Each year, season, sex and age limits are set to protect the seal herd, and estimated harvest ranges are reconsidered.

REQUEST FOR A SMALL TAKE OF BOWHEAD AND GRAY WHALES

NMFS has received a "small take" request from Amoco Production Co. Inc., Chevron U.S.A., Inc., Exxon Co. U.S.A., Shell Western E&P, Inc., Unocal Corp., and Western Geophysical Co. of America. The taking is described as incidental and unintentional harassment of bowhead and gray whales during pre-lease and post-lease exploration for oil and gas resources in Alaska State Waters and on the Outer Continental Shelf of the Chukchi and Beaufort Seas. Activities likely to be undertaken include geological and geophysical surveys, drilling of stratigraphic test wells, exploratory drilling for oil and gas, and associated support activities. Potential sources of incidental taking are noise, unpermitted discharge (oil spills) and physical obstruction. The request does not concern activities involved in the development or production of offshore oil and gas fields. Also, the spring lead system through which bowhead whales migrate from mid-April to early June in the Chukchi Sea and the Beaufort Sea to Point Barrow is excluded from the scope of the petition. The requested period of the regulations is for five years.

When a request is made for an incidental take of depleted marine mammals, the requirements of both the MMPA and the ESA must be met. The activities included in the petition (with the exception of pre-lease geophysical exploration) were recently addressed by NMFS in biological opinions concerning Outer Continental Shelf lease sales 97 and 109.

Section 101(a)(5) of the MMPA directs the Secretary of Commerce or the Interior to allow, on request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region. This permission may be granted for periods of 5 years or less if the Secretary finds that the total taking will have a "negligible impact" on the species or stock and will not have an "unmitigable adverse impact" on the availability of species or stock for subsistence uses. Each activity requires separate, specific regulations...a process that takes about one year from the time the authorization is requested. This is the first request for a take of depleted species under the 1986 amendments. Prior to this amendment, only non-depleted animals could be taken. Proposed procedural regulations were published in the Federal Register on March 15, 1988.

Since 1982, NMFS has granted exemptions for a "small take" of ringed seals incidental to seismic exploration on the ice in the Beaufort Sea and to the Air Force for a take of seals and sea lions incidental to launchings of the space shuttle over the Northern Channel Islands from Vandenberg Air Force Base, California.

PERMITS FOR PUBLIC DISPLAY AND SCIENTIFIC RESEARCH

Under the MMPA, NMFS issues permits for taking or importing marine mammals for scientific research or public display. NMFS reviews and decides whether to issue the requested permits, and monitors them as long as animals are maintained under the authority of a permit. Currently, NMFS is monitoring 635 permits for scientific research and public display.

During the past year, NMFS considered 69 applications for permits; 64 involved marine mammals. Of these, 19 permits have been issued for scientific research and 14 for public display. One permit was denied, 13 applications were returned or withdrawn and 17 applications are pending final action.

NMFS also processes requests for permit modifications or authorizations of activities under permits. During the past year, 96 permit modification/authorization requests were processed; 92 were for activities involving 74 marine mammal permits. NMFS has issued 35 modifications and 44 authorizations; 8 requests were not granted or withdrawn, and 5 are pending final action.

See Tables 2 through 9 in the Appendix for an overview of the permit program during the past year.

Permit Program Review. The permit program has been operating for about 15 years, and NMFS believes it is time to review the policy, criteria and procedures used to evaluate applications and to issue and monitor permits. This review is being conducted in consultation with the scientific community, the public display industry, environmen-

tal organizations and other interested parties. Regulatory and policy changes resulting from this review should make the program more efficient and more responsive to applicants' concerns as well as the needs of marine mammals.

The review has five objectives:

Clarify and/or confirm general policies that should govern the overall direction of the program pursuant to the Acts;

Develop permit issuance criteria and procedures that are clearly formulated, consistent, and more responsive to applicant needs and concerns;

Determine the circumstances under which the National Environmental Policy Act applies to the permit program;

Identify administrative procedures that result in a more streamlined and efficient process; and

Recommend changes to existing regulations necessary to accommodate these improvements.

The Service is undertaking the review of its permit program in four phases:

PHASE 1: Issue analysis and initial discussion paper

PHASE 2: Federal Register notice and informal public consultation on issues and alternative solutions

PHASE 3: Appointment of an independent Review Group and revised discussion paper

PHASE 4: Public meetings and final recommendations

While the timing of the review has to remain flexible to allow for full public involvement, the Service anticipates completing PHASE 3 by December 1988 and initiating formal hearings by Spring 1989.

Swimming With Dolphins. In April 1988, NMFS held two public hearings (Washington, D.C. and Islamorada, Florida) concerning human/dolphin swim programs. NMFS began issuing authorizations to conduct human/dolphin swim programs in 1985 under public display permits. NMFS has

considered the programs experimental until sufficient information can be obtained to assess the effects of the programs on the health and well-being of the animals. Questions have also arisen on whether these programs constitute public display as envisioned by the Act. Concern for human safety and liability have also been considered. The hearings were held to ensure that all interested parties had the opportunity to comment on the issuance of authorizations for the conduct of these swim programs. NMFS has not made a decision on whether to continue authorizing these programs.

WHALE WATCHING WORKSHOP

Since the late 1970's, NMFS has been concerned that marine mammals, especially the great whales, may be adversely affected by activities associated with whale watching. In November 1987, NMFS issued interim rules regulating the approach of humpback whales in Hawaiian waters. Previous guidelines addressing whale watching in Hawaiian waters were not effective in preventing harassment of these whales.

NMFS will sponsor a whale watching workshop in November 1988 to bring together members of the scientific community, the environmental community, and industry to review information and

determine the effects of whale watching and how adverse effects can be kept to a minimum. The results will be used to develop a national policy and action plan.

In addition to Hawaii, we are aware of whale watching activities along the West Coast of the United States during gray whale migrations; in Alaska during the summer tourist season; in the summertime in the Northeast especially around Cape Cod and the Gulf of Maine; and in the Caribbean where humpback whales gather during the winter months.

STRANDINGS OF MARINE MAMMALS

All five NMFS Regions operate marine mammal stranding networks made up of individuals and organizations that have volunteered to cooperate with NMFS to collect scientific specimen materials, record stranding events with the Regional Coordinator, and assist local and Federal authorities in removing stranded animals. The Networks have provided an effective framework for handling stranded animals, conducting scientific research, and informing the public.

Stranding Workshop

NMFS along with Sea World Research Institute and Eckerd College, St. Petersburg, Florida, sponsored the second Marine Mammal Stranding Workshop in December 1987 to discuss what the Networks have done well, what they could do better, what type of research should be emphasized and what funding requirements are needed for network activities. The following recommendations were made by the participants:

Communication and public education should be enhanced; data should be collected as accurately and completely as possible using standardized data forms; mechanisms to assess performance and to ensure quality control should be developed; a tissue bank for marine mammal specimens should be established, archived, and advertised among scientists who might use such specimens for research; and individuals should be responsible, ethical and courteous in their use of stranding data. Also, guidelines should be developed to suggest to whom stranding data "belong".

Dolphin and Whale Strandings on the East Coast

Two unusual stranding episodes recently occurred along the U.S. Atlantic Coast. The first, involving bottlenose dolphins, started in July 1987 along the coasts of New Jersey, Delaware, Maryland, and Virginia. During the fall, as the dolphin population migrated south for the winter, larger than normal numbers of strandings occurred along the coasts of the Carolinas and Georgia. Strandings occurred at a much higher rate than normal during December through March along northeastern and central Florida, while decreasing to the north. The high rate of strandings did not occur further south than central Florida, and, since April 1988, the stranding rate has been close to normal. A loss of 742 dolphins has been documented.

NMFS formed the Atlantic Bottlenose Dolphin Response Team to investigate these unprecedented deaths. Pathological examinations have shown that the dolphins died from massive bacterial infections. These bacteria normally are found in these dolphins and it is questionable whether the animals would have been vulnerable to these infections unless they had been affected by disease, toxins, stress, or other factors which weaken the immune system. Although viruses have been isolated from dead dolphins, it is not known if these caused the epidemic.

The second stranding episode primarily concerned humpback whales in the vicinity of Cape Cod. Beginning in late November 1987 and ending in early February 1988, a total of 21 whales

died including 15 humpbacks, 4 minke and 2 fins. We believe that the whales died from biotoxins ingested when feeding on large amounts of mackerel. The source of the biotoxin, which concentrates in the internal organs of fish, is unknown.

In dealing with each of these incidents, NMFS cooperated with the Marine Mammal Commission, the Smithsonian Institution and other local, State and Federal agencies in establishing investigative response teams. The efforts of local marine aquaria, academia, and the environmental community helped NMFS respond effectively to these emergencies.

Regional Networks

Northeast. This network investigated the deaths of the humpback, fin and minke whales that came ashore in the Cape Cod area. Tissue samples, stomach contents and fluids were collected for analysis. Several cooperating laboratories from NMFS, the State of Massachusetts, U.S. Department of Agriculture, and the Virginia Medical Center performed chemical toxicity, biotoxin, and virology tests. In addition, experts in the fields of biotoxin and shellfish poisoning assisted. Samples of mackerel landed at New England ports were collected for analysis by the Northeast Fisheries Center. Test results indicated the presence of as yet unidentified biotoxins in the liver of mackerel. Further testing on the continued presence of biotoxin in mackerel and other species is being conducted.

Southeast. This network assisted in investigating the deaths of bottlenose dolphins along the East Coast. Since stranding cooperators could not handle the numbers of beached dolphins, NMFS' Southeast Fisheries Center established a field team to collect and examine specimens.

The network maintains a current directory of all participants, and the Regional Director has issued Letters of Authorization (LOA) to over 100 qualified participants. All authorized cooperators complete standard data forms for

each stranding and submit these forms to Dr. Daniel K. Odell, Sea World Research Institute (volunteer Scientific Coordinator for the network) for data entry. Summaries of strandings are published on a quarterly basis.

California. With the closing of the Marineland pinniped rehabilitation center in March 1987, SWR personnel monitored the transfer of these animals to Sea World and coordinated the development of interim procedures to accommodate animals stranded in the Los Angeles area. The Region has been working closely with the representatives of the owners of Sea World (Harcourt, Brace, Jovanovich, Inc.), the City of Los Angeles, and the Los Angeles Unified School District to establish both a temporary and a permanent new treatment center for the greater Los Angeles area.

In 1987, 346 pinnipeds, 67 cetaceans (Table 3), and 3 marine turtles were reported to have stranded on the California coast. A report presented at the Biennial Meeting of the Society for Marine Mammalogy outlined preliminary findings concerning the fate of pinnipeds released from California treatment centers. This report found that it is unlikely that treated and released seals and sea lions are contributing to a measurable increase in marine mammal/fishery interactions.

Hawaii. Six cetaceans were reported to the Hawaii Stranding Network in 1987. They included one rough-toothed dolphin, one spotted dolphin, two humpback whales, one dwarf sperm whale, and one spinner dolphin. The number of strandings in 1987 was down from the previous year's number (11) and was perhaps more representative of an "average" year for stranding incidents.

Northwest. The Northwest Marine Mammal Stranding Network responded to over 400 marine mammal strandings in Washington and Oregon. In the Northwest, the general public is advised to report strandings to the Washington State Patrol or the Oregon State Police who relay the information to one of five volunteer Stranding Network Response Centers. The Response Centers coor-

dinate the appropriate action which varies from providing advice to dispatching a team of scientific investigators.

Table 3. Cetaceans stranded during 1987 on the California coast as reported to NMFS by the California Marine Mammal Stranding Network.

Common Name	Number Reported	% Total
Gray whale	23	34.2
Common dolphin	14	20.9
Harbor porpoise	14	20.9
Bottlenose dolphin	5	7.5
Pacific white-sided dolphin	5	7.5
Dall's porpoise	3	4.5
Blue Whale	1	1.5
Dwarf sperm whale	1	1.5
Unident. delphinid	1	1.5
TOTALS	67	100.0

Alaska. The Alaska Region network investigated the strandings of 15 whales and 2 porpoises. Gray whales were the most commonly stranded species (6), followed by humpback whales (4) and beluga whales (2). Also, entanglement of 7 humpback whales in salmon gillnet fisheries in Southeast Alaska were investigated. Five were eventually released alive, and one freed itself. The seventh animal died. Because of this large number of entanglements, the Alaska Region is developing a "whale hotline" to provide a quick rescue response to entangled whales. From 1975 to 1987, the most commonly stranded cetacean found in Alaska was the gray whale (127 reports). Other commonly found species included the beluga whale (58), Stejneger's beaked whale (29), killer whale (20), Cuvier's beaked whale (19), minke whale (19), bowhead whale (11), humpback whale (9), sperm whale (9), Baird's beaked whale (8) and fin whale (7).

INTERNATIONAL PROGRAMS

International Whaling Commission (IWC)

1987 IWC Meeting. The United States had three primary objectives for the 39th Annual Meeting: to continue to support the implementation of the moratorium decision, to clarify the type of research involving the killing of whales that is consistent with the IWC's conservation program, and to secure a bowhead whale quota that is consistent with the IWC's aboriginal/subsistence whaling management scheme. These objectives were substantially achieved.

The IWC Moratorium Decision. The 39th Annual Meeting did not amend the moratorium decision or take any action to modify its substance.

Three member governments (Japan, Norway, and the USSR) objected to the moratorium which removed them from any technical obligation under international law to comply. In 1985, the Soviet Union announced that it would temporarily stop commercial whaling for the 1987-88 Antarctic whaling season for technical reasons. In 1986, the Government of Norway announced that it would end its commercial whaling following the 1987 season. Also in 1986, the Government of Japan notified the IWC that it withdrew its objection on July 1, 1986, effective May 1, 1987 with respect to commercial pelagic whaling; from October 1, 1987 with respect to commercial coastal whaling for minke and Bryde's whales; and from April 1, 1988 with respect to commercial coastal sperm whaling. This withdrawal will lapse by its own terms only if at any time before April 1, 1988, the Secretary of Commerce receives a final unappealable order from any U.S. court requiring cer-

tification under U.S. law of Japanese commercial whaling.

Scientific Permits. In preparation for the 1987 IWC meeting, the U.S. Secretary of Commerce instructed the U.S. IWC Commissioner to clarify the type of research conducted under scientific permits that is consistent with the IWC conservation program. The U.S. drafted a proposed resolution on scientific research programs that included additional criteria to be used by the Scientific Committee when reviewing research proposed under scientific permits. It also provided a mechanism for the Commission to recommend to Member Governments that they refrain from issuing, or revoke such permits. The Commission adopted this resolution.

The Commission passed resolutions recommending that the Governments of the Republic of Korea, Iceland and Japan refrain from issuing, or revoke, scientific permits either currently in force or proposed until favorably reviewed by the Scientific Committee.

Aboriginal Whaling. The Technical Committee of the Aboriginal/Subsistence Whaling Subcommittee met before the annual meeting and considered reports from Denmark, the Soviet Union, St. Vincent and the Grenadines, Japan, and the United States on whale catches needed to meet nutritional, subsistence and cultural needs. The United States presented a proposal for a bowhead whale catch limit for 1987 of 32 strikes and for 1988 of 35 strikes. The Committee endorsed this proposal and the Commission took the same action, marking the first time that the IWC has set bowhead whale quotas without debate.

The Commission adopted the recommendation of the Technical Committee that a quota of three humpback whales per year be permitted to be taken by Bequians of St. Vincent and the Grenadines, but only if the meat and products of the whales are to be used for local consumption.

Following the submission of additional information on the Japanese proposal that its small-type minke whaling be recognized as similar to aboriginal subsistence operations, discussion focused on the definition of aboriginal subsistence whaling. The Subcommittee was unable to make any recommendations, but the Commission agreed to establish an ad hoc working group within the Subcommittee to examine the terms and definitions of whaling for commercial purposes, aboriginal subsistence whaling and other categories.

The Commission also set the following additional aboriginal catch limits for 1988:

Eastern Pacific gray:	170
West Greenland minke:	110
West Greenland fin:	10
Central Atlantic minke:	12

Whale Stocks and Catch Limits. Catch limits for commercially exploited stocks continued to be set at zero for the 1988 coastal and the 1987-1988 pelagic whaling seasons as a result of the 1982 moratorium decision.

Comprehensive Assessment. The Joint Working Group of the Technical and Scientific Committees recommended, and the Commission endorsed, the following recommendations regarding the assessment of whale stocks:

- 1) the Secretariat computing facility should be used for carrying out second stage testing of management procedures,
- 2) the new techniques of DNA analysis should be further developed for stock identity studies,
- 3) monitoring studies should be continued,

4) a contract study should be carried out to analyze Southern Hemisphere minke whale marking data;

5) a workshop should be held to address the use of natural markings to identify whales in order to estimate population parameters; and

6) those nations who have exploited minke whales in the North Atlantic be requested to supply a description of methods and hunting strategies of those operations.

The Commission agreed that the Scientific Committee should give priority to those stocks for which there had been substantial whaling activity before the moratorium, where much information has been accumulated, and on which substantial scientific work is underway.

Humane Killing. The Technical Committee Working Group on Humane Killing reported on discussions concerning the Alaskan bowhead whale hunt, the Greenland whale hunt, the Faroese-pilot whale fishery, use of neurotoxins, experiments on 90mm harpoon grenade technology, and national laws relevant to killing animals. The Commission endorsed the actions of the Working Group.

The United States presented papers concerning the time it takes landed whales to die and the hunting efficiency and recovery methods in the Alaskan Eskimo subsistence hunt. It was noted that time of death was actually the time until the whale was brought under control and often that meant the time until brought to shore. A new penthrate projectile, developed by Norwegian specialists under contract to the Alaska Eskimo Whaling Commission, will be used as soon as tests are completed. The improved projectile will be used in traditional weapons and offers an increased potential for achieving instantaneous kills.

North Pacific Fur Seal Commission

The Interim Convention on Conservation of North Pacific Fur Seals, signed in 1957 by Canada, Japan, the Soviet Union and the United States, expired when the United States declined to ratify a Protocol to extend the Convention. Opposition to the Protocol was based on its commercial harvest provisions in light of the recent declines in the Pribilof Island population of fur seals. The United States is currently managing fur seals, including a subsistence harvest on the Pribilof Islands under the MMPA and the Fur Seal Act. In February 1988, the North Pacific Fur Seal Commission officially concluded its activities with the disbursement of all remaining cash reserves to the former Parties. The original Fur Seal Treaty was signed in 1911 and was one of the oldest international agreements for the conservation of a natural resource.

The purpose of the Commission was to achieve the maximum sustainable productivity of the fur seal herd through the coordination of research programs and conservation measures carried out by the member governments. In an effort to renew international efforts for the conservation of the Northern fur seal, the United States hosted informal consultations in September 1987, emphasizing coordinated international research and a continued ban on pelagic sealing, and proposed that a new international agreement be considered.

International North Pacific Fisheries Commission (INPFC)

The United States and Japan signed a memorandum of Understanding (MOU) on marine mammals on June 8, 1987, which remains in effect until June 1990. The MOU was developed in connection with the International Convention for the High Seas Fisheries of the North Pacific Ocean and was a condition of the General Permit issued by the United States in June 1987 to Japanese salmon fishermen who operate in the U.S. Exclusive Economic Zone (EEZ). As with three previous MOUs, the agreement provides for cooperative research on Dall's porpoise and other marine

mammals incidentally caught in the Japanese high seas salmon fisheries.

At the 1987 annual meeting of the INPFC, the Sub-Committee on Marine Mammals reviewed 1987 research activities and those planned for 1988. The Sub-Committee also reviewed documents that highlighted studies on the abundance of Dall's porpoise stocks in the North Pacific, the reduction of incidental marine mammal takes in the salmon fishery based upon gear modifications, as well as biological studies on the animals taken incidentally during 1981-86 in the landbased salmon fishery.

US-USSR Marine Mammal Project, Environmental Protection Agreement

This project promotes joint research and exchange of information by U.S. and Soviet scientists on the biology, ecology and population dynamics of marine mammals of concern to both countries. The 1987 studies included the following.

Three U.S. scientists participated in a joint research cruise aboard a Soviet sealer/trawler, the ZRS ZAKHAROVO, during September-October to study the biology and population structure of Pacific walrus and bearded seals in the Bering and Chukchi Seas. The data obtained will help determine the current status of these populations. A total of 623 walrus and 2 bearded seals were collected during the cruise, and extensive information was obtained on food habits, size, and condition factor, pregnancy rate and age structure of the population.

In October and November, two Soviet scientists worked at Hubbs Marine Research Institute, the NMFS Southwest Fisheries Center, and the Smithsonian Institution in Washington, D.C. to develop information on distinguishing variations in color patterns of harbor seals, a species widely distributed in the North Pacific Ocean, and to

continue work on the development of approaches to the taxonomic study of dolphin osteological materials.

Inter-American Tropical Tuna Commission (IATTC)

At its 1987 annual meeting, the IATTC adopted a resolution on the incidental take of porpoises,

calling on all interested nations whose flag vessels participate in the eastern Pacific purse seine tuna fishery to take appropriate steps to encourage their fishermen to employ fishing gear and procedures that have proven effective in reducing incidental porpoise mortality. The resolution also noted the availability of the IATTC staff in implementing the recommendations.

ENFORCEMENT OF THE MMPA

The provisions of the MMPA are enforced by Special Agents of NMFS with support from state enforcement officers. NMFS employs about 95 Special Agents and has cooperative enforcement agreements with the following states: Florida, Alabama, California and Washington. Cooperative agreements allow state officers to enforce the MMPA.

In the past year, Special Agents spent about 3,694 work hours investigating 117 alleged violations of the MMPA. Of these, 44 percent involved the unlawful taking (including harassment) of marine mammals, and 31 percent involved unlawful importations primarily of marine mammal parts and products.

Cases of particular interest include the following:

- In May 1987, NMFS Special Agents seized 3,400 Northern fur seal skins at the Fouke Company in Greenville, South Carolina. These skins were from the 1985 subsistence harvest, allowed under the MMPA, on St. Paul Island, and had been sent to Fouke by the Tanadgusix Corporation of St. Paul Island. At the time, Fouke was not a registered tannery, and there was no evidence that the skins were to be used for native handicrafts. Under the terms of a settlement agreement, Tanadgusix paid a \$5,000 penalty and forfeited the seized skins to the United States. A settlement agreement is still being negotiated with Fouke.
- The captain of a San Diego tuna seiner was convicted in U.S. District Court for unlawfully shooting and harassing bottlenose dolphins that became trapped in a purse seine. The incident, which occurred off southern Mexico, was witnessed by a NMFS observer aboard the vessel. The convicted captain is awaiting sentencing which could include time in prison.
- In California, NMFS Special Agents observed two separate gillnet vessels retrieve sea lions and porpoise from their nets. The vessel that took the porpoise had a certificate of inclusion to allow the taking of certain marine mammals during fishing operations, but the porpoise was not an allowed species. The vessel that took the sea lions did not have a certificate of inclusion. It is unusual for NMFS Special Agents to actually observe these kinds of violations as they occur.
- A case was made against another tuna boat captain for interfering with a NMFS observer and preventing the observer from accomplishing his assigned duties.
- Another tuna boat captain was charged with unlawfully taking marine mammals when he shot and wounded a species of porpoise not included in his certificate of inclusion.
- A NMFS Special Agent in Florida seized a shipment of 357 wallets made from southern fur seal skin which was imported from Uruguay. The NOAA Office of General Counsel is negotiating a settlement of this case.

DEPLETED MARINE MAMMALS

Northern Fur Seal

NMFS has designated the Pribilof Island population of North Pacific fur seals as depleted under the MMPA. This action is required when a species or population stock falls below its optimum sustainable population (OSP). Since the current Pribilof Island population of North Pacific fur seals is below 50 percent of the population levels observed in the 1940s and early 1950s, it is below its OSP and, by definition, depleted. The designation became effective June 18, 1988.

The Pribilof Island population of North Pacific fur seals has declined from about 2.2 million in the 1950's to 800,000 today, and the causes of the decline remain under investigation.

Once a stock is designated as depleted, the MMPA requires additional restrictions on taking and importation. Intentional takings are permitted only for research, subsistence and handicraft purposes by Alaska Natives. Small unintentional incidental takes resulting from other activities may be allowed under certain circumstances.

From 1957 through 1984, a commercial harvest of fur seals on the Pribilof Islands was conducted by the United States under the authority of the Interim Convention on Conservation of Fur Seals. When the U.S. Senate did not ratify the protocol that would have extended the Convention, NOAA determined that a commercial harvest could not take place under existing domestic law.

A major objective of NMFS' research is to identify and eliminate the causes of the population's decline. In 1987, NMFS scientists conducted fur seal research on the Pribilof Islands, Alaska, and on the Channel Islands, California.

Northern Sea Lion

Based on a preliminary review of a status report on the Northern (Steller) sea lion in Alaska, NMFS has published an advance notice of proposed rulemaking (May 6, 1988) to consider designating this population as depleted. If this population stock is designated as depleted, the MMPA requires the application of certain additional restrictions on taking and importation. In this instance, based on recent court decisions, restrictions on commercial fishing in the North Pacific Ocean and Bering Sea are possible consequences.

The report, "Status Review, Northern (Steller) Sea Lion (*Eumetopias jubatus*) in Alaska" (January 1988), concludes that the number of adult and juvenile sea lions observed on rookeries in southwest Alaska declined at least 52 percent from approximately 140,000 in 1956-60 to about 68,000 in 1985.

Although the number of Northern sea lions has declined throughout Alaska (52 percent overall in 27 years), the greatest decline has been observed in the eastern Aleutian Islands (79 percent) and western Gulf of Alaska (73 percent). Declines have also occurred in the central Gulf of Alaska (31 percent) and central Aleutian Islands (8 percent). These declines may have occurred in two phases. The first phase probably began in the

early 1970s and was confined to the eastern Aleutian Islands and western Gulf of Alaska. Numbers of sea lions in the Aleutians and Gulf of Alaska fell by 25 percent (1.6 percent per year) between 1958-77. Numbers in the eastern Aleutian Islands appeared to stabilize in the mid-1970s while those in the central Aleutians and western Gulf may have increased slightly. A second phase of the decline probably began during the late 1970s affecting all areas and resulting in a further decline of 36 percent (5.2 percent per year) between 1977-85. During 1986-87, counts of adults and pups at Marmot Island, the largest rookery in Alaska, indicate that the decline is continuing. Pup counts at Marmot Island totalled 6,741 in 1979, 4,286 in 1986 and only 2,910 in 1987.

Fisheries-related mortality factors have been examined as possible causes of the observed declines in northern sea lions. These factors include incidental take in the course of commercial fishing in the Bering Sea and North Pacific Ocean, directed killing of sea lions by fishermen, changes in quantity or quality of prey species, especially walleye pollock, and entanglement in lost or discarded fishing gear or other debris. NMFS is also examining reproduction and natural mortality rates, changes in environmental carrying capacity, oceanographic conditions, disease and toxic substances, predation, and the effects of past commercial and subsistence harvests.

NMFS has awarded a contract to the Alaska Department of Fish and Game to determine the availability of data on incidental mortality (i.e., entanglement and shooting) of northern sea lions in U.S. domestic fisheries (e.g. longline, trawl, purse seine, gillnet, etc). This study will identify the sources of data, as well as estimate the coverage and reliability of these data.

Hawaiian Monk Seal

In May 1988, NMFS extended critical habitat for Hawaiian monk seals from 10 to 20 fathoms in all areas previously designated as critical (April 1986). NMFS believes the designation of critical

habitat to 20 fathoms (under a provision of the Endangered Species Act) will benefit the species because it includes additional areas that may require special management consideration or protection. Also, Maro Reef was added to the areas designated as critical.

The final rule designated as critical habitat all beach areas, including all beach crest vegetation to its deepest extent inland, lagoon waters, and ocean waters out to a depth of 20 fathoms, around Kure Atoll, Midway Islands (except Sand Island and its harbor), Pearl and Hermes Reef, Maro Reef, Lisianski Island, Laysan Island, Gardner Pinnacles, French Frigate Shoals, Necker Island, and Nihoa Island. References to beaches or beach areas include all sand spits and islets.

NMFS estimates that there are 1,500 Hawaiian monk seals.

Research. Hawaiian monk seal population monitoring, research and recovery activities are conducted by the Honolulu Laboratory of the Southwest Fisheries Center. An estimated 204 pups were born during the 1987 breeding season, the highest number since monitoring of all main rookery areas in the Northwestern Hawaiian Islands was initiated in 1983. Analysis of tag resighting data this year indicated that survival of young seals is very high, with a mean annual survival rate of 0.89 for males and 0.91 for females to 4 years of age. No strong differences were apparent between the sexes, among island populations, or among cohorts. From these findings, it appears that under present circumstances, survival of juvenile seals is not an impediment to recovery of the species.

However, two of the breeding populations show no sign of recovery in spite of high juvenile survival. At Laysan Island, the number of births has remained about the same over the last 10 years, and at Lisianski Island, the trend in births is down. These two populations have a highly skewed adult sex ratio with at least two males per female, in spite of equal numbers of immature males and females. Attacks by adult males on adult females at these two locations appear to result in higher mortality in females. Research on this problem is in

progress (following a plan developed at a February 1987 workshop) including trials with hormone analogs directed at reducing this aggressive behavior in captive adult male seals.

The Kure Atoll female pup head start project was again conducted in 1987. Six pups were born, and three females were collected at weaning for temporary captive maintenance. In 1986, only one pup (male) was born at Kure Atoll, the lowest year in the downward trend from 30 pups per year when the U.S. Coast Guard began occupation of the island 25 years ago. However, in 1987, the 6-year-old females from the first year of the project (1981) began giving birth. The present high juvenile female survival resulting from head starting programs, together with the introduction of rehabilitated yearling females from French Frigate Shoals, is expected to result in increasing births. Coast Guard disturbance of monk seals on the beaches needs to be further reduced to preclude high mortality in these newly recruited breeding females.

A cooperative research effort with the Smithsonian Institution resulted in the finding that 87 percent of females pupping on East Island at French Frigate Shoals fostered at least one pup other than their own. On average, the total duration of foster care by females was found to be just under half of the total duration of care for their own pups. The impact of this behavior on pup development and survival is still being assessed.

Bowhead Whale

Research. An aerial study of bowhead whales was conducted in the Point Barrow, Alaska, area April 19 to June 7, 1987, to collect photographs of the dorsal views of bowhead whales for length measurements and identification of individuals. The cumulative total from the 19 flights was 395 bowheads seen and 281 photographed. Problems with the aircraft's altimeter and long periods of dense fog prevented a full-season study of migration. Of adult animals, 79 to 153 reidentifications

were made, all indicating travel along the expected migratory corridor.

Results from the 1985 and 1986 studies were based on 543 and 234 measured whales respectively. Migrating animals were temporarily segregated since small animals traveled late in the season. Calves comprised 1.1 percent of the 1985 sample and 12.4 percent of the 1986 sample. In 1986, there was a small proportion of evident yearlings which matches the low calving rate of the previous year. Assuming a calving interval of 3 years (as established with right whales), a gross annual reproductive rate of 0.065 and 0.092 was calculated for 1985 and 1986 respectively.

For the years 1984-86, there were 530 individually identifiable bowhead whales in the photographic collection. Using 73 pairs of resightings where each resighting was at least 0.3 km from the original sighting, it was calculated that whales migrated past point Barrow on a median direction of 67 degrees True and at a mean speed of 4.1 km/hr. Younger animals (except calves) arrived earlier in the migration than did older animals as suggested by the increased amount of white on the caudal peduncles as the season progressed. The extent of white has been correlated to whale size which is assumed to correlate with age. Calves appeared late in the season accompanied by large adults. Whales reidentified between years showed variable consistency in migratory dates, within 5 days for some, as much as 20 days difference for others. A mark/recapture analysis, based on 205 whales photographed between May 2, and June 1, 1985 and 164 from the same date in 1986, resulted in 6 resightings. From these data, the Peterson estimate of the bowhead population size is 4,855 (95% confidence interval = 553-8,157). This is only one method that has been used to estimate the population size of bowheads; the small sample size and extremely small number of resightings results in a large estimate of variance, and, therefore, the wide confidence interval.

Humpback Whale

NMFS has issued interim regulations that limit approaching humpback whales in Hawaiian waters. Most of the North Pacific populations of humpback whales winter in the waters around the main islands of Hawaii. NMFS' primary concern for humpbacks is related to whale watching, vessel traffic, nearshore construction and development, and research activities. In 1979, the Southwest Region issued a "Notice of Interpretation" which defined certain activities in close proximity to whales as "taking by harassment" and, therefore, illegal. Recent studies found that whales were avoiding vessels, or areas of high vessel activity, in Hawaiian waters, and NMFS believes this may be caused by a lack of compliance with the Notice.

Although it is a rare occurrence in Hawaii, boat operators were reminded of two incidents of vessels striking humpback whales. Research activities, including acoustic playback experiments, cow-calf behavior, and general distribution, were monitored by NMFS enforcement agents at Maui and the Big Island.

As part of the continuing management program for humpback whales, NMFS conducted consultations under Section 7 of the Endangered Species Act. Federal projects were reviewed and recommendations made to ensure that associated activities would not jeopardize the continued existence of humpback whales. Also, as a part of its ESA responsibilities, NMFS has appointed a Recovery Team for the humpback whale, and a Recovery Plan will be developed and implemented.

North Pacific Ocean. NMFS brought together humpback whale researchers to preview and provide suggestions for improving a computerized system for cataloging and sorting humpback whale fluke photographs. The system will aid scientists in estimating population abundance and stock identification. This first comprehensive system established for the entire North Pacific is now in operation.

Atlantic Ocean. The congregation of humpback whales off the New England coast in the summer has been responsible for the growth of a large whale-watching industry. However, 1986 witnessed a shift in the summer distribution of humpback whales. Since the late 1970's, humpbacks have spent their summers feeding in an area known as Stellwagen Bank in the lower Gulf of Maine. In 1987, few humpbacks appeared, and vessel cruises and aerial work revealed that the majority of animals were in an area of the Great South Channel south off Cape Cod. However, right whales and sei whales were sighted frequently in Gulf of Maine waters although sei whales do not normally occur there. The shift in humpback whale distribution may be related to a decrease in abundance or change in distribution of sand lance, their primary prey species.

Researchers at the College of the Atlantic are continuing to maintain a North Atlantic humpback fluke photo-catalogue. This catalogue helps researchers monitor the population demographics, mortality, and habitat use of individual animals, and will be used in determining population estimates through mark-recapture analysis.

Researchers at the Provincetown Center for Coastal Studies are continuing to study the seasonal distribution and abundance of fin, right and humpback whales in Cape Cod Bay, along the Provincetown Slope, and in the Great South Channel. Also, oceanographic, behavioral, photographic, and population demographics information were collected. Additionally, in high-use habitats, researchers documented the oceanographic and geographic characteristics of those regions to identify what attracts and maintains groups of whales. The photo-identification and demographics of known humpback whales were used to determine tissue sampling priorities for 14 humpbacks that died off Cape Cod in December 1987.

A study on the stability of humpback fluke patterns will involve the analysis of a time series of photographs of known animals archived at the Provincetown Center for Coastal Studies. The

analysis is for quantifying changes and degree of change in north Atlantic humpback fluke patterns.

Right Whale

NMFS has appointed a recovery team for the right whale, and a recovery plan is being drafted by NMFS and the team. Through a cooperative agreement with the University of Rhode Island, NMFS has implemented an integrated research program on the North Atlantic right whale. A consortium of research institutions will take part in studies to detect changes and causes of changes in the population size and distribution of this species. The research involves four tasks:

1) Development of a data base that incorporates data collected since 1956. The format will allow each sighting event to be recreated.

2) Aerial surveys made principally in the southeast region (Cape Hatteras to southern Florida) to collect distribution, abundance, population demographics, photo-identification, and other data.

3) Shipboard surveys will be made principally in the northeast region (Nova Scotia to Great South Channel) to obtain data on distribution, respiration rates, micro-scale movements, high-use habitats, behavior, social groups, ecological and oceanographic parameters. Photographs will be taken for individual identification and of cow/calf pairs to determine size/age estimations and reproductive and mortality rates.

4) Data analyses that will include abundance estimates using standard line and strip transect methods; mark-recapture studies; and population demographics using field sighting data including length and size composition, sex, calving rates, nursing duration and mortality rates. Additionally, high-use habitats will be documented and described in relation to oceanographic and biological parameters.

Recent information on the distribution of right whales off the southeast coast, particularly their calving grounds off northern Florida and Georgia, has prompted increased scrutiny of activities which may affect this species. Section 7 consultations under the Endangered Species Act have addressed right whale/Federal activity conflicts in the Georgia and northern Florida area. In the case of the U.S. Navy (Kings Bay Project), NMFS has requested the implementation of additional measures to reduce the chances of right whales colliding with dredges. NMFS recommends that any Federal activities which may impact right whales on their calving grounds be conducted outside of the January-March calving season.

Gray Whale

For more than two decades, NMFS has counted the gray whale population during its southbound migration at Granite Canyon (south of Monterey), California. Recent censuses counted 5,344 whales in 1984/85, and 5,341 in 1985/86. The estimated population size in 1985 was 18,500. During the 1985/86 census, there was an apparent change in the offshore distribution during the migration (the distance of whales from shore was greater), and an unknown number may have been missed due to the greater distance. As a result, the population estimate was lower than in 1985, but the 1986 figures could not be used because of a lack of comparability.

Another census was conducted in 1987/88, combining shore counts and aerial surveys to determine offshore distribution (hence, "sightability" from shore). This year's effort counted over 6,100 gray whales passing the granite Canyon station, with an estimated 98 percent passing within 3 miles of shore, thus ensuring reliable counts by the shore-based observers.

The estimated population size, as a result of this study, is 21,113 (standard error 688).

The Southwest Region is monitoring and assessing the rate of gray whale entanglement in fishing

The SEFC and the Smithsonian cooperated in a series of beachfront aerial surveys that were conducted to monitor stranding rates. Four surveys of the coast from New Jersey to northern Florida have been completed, and one more is planned.

Effects on Abundance. An offshore aerial survey was conducted off the New Jersey-Cape Hatteras area during August 1987, to estimate abundance. The survey area replicated part of the area covered by the 1979-81 Cetacean and Turtle Population and Abundance (CETAP) Surveys. A comparison with the CETAP data indicated there was about a 60 percent chance that there was a decline in abundance, but there was more than a 90 percent probability that the decline was less than 40 percent. Aerial surveys are being used to intensively monitor the bottlenose dolphin population in the Indian/Banana Rivers, Florida, area during mid-January through mid-March.

Live-Capture. Up to 25 bottlenose dolphins from populations along the U.S. mid-Atlantic coast that were affected by the epidemic were captured and examined. Bacterial, viral and other samples were collected. The pathology of several animals with the same symptoms as those that died during the epidemic are being analyzed.

Beluga Whale

Beluga Whale Technical Committee. Beluga whales are an important subsistence resource in several Alaskan villages. Alaska Native groups have become concerned that there may be increased pressure for regulating their beluga whale

hunts. To protect their traditional hunts and to provide a forum for the exchange of scientific information, the North Slope Borough has proposed the formation of an Alaska Beluga Whale Technical Committee to develop a management plan in conjunction with subsistence hunters and government agencies. Additional goals will be to compile harvest records, define research needs, and provide a contact point for coordinating local, regional and international concerns. NMFS has been actively involved in the development of this committee.

Atlantic Ocean-Multispecies Studies

Since 1980, Manomet Bird Observatory has used principally NMFS research vessels as survey platforms to observe sea birds, marine mammals, and sea turtles between Nova Scotia and Cape Hatteras, North Carolina. The 1980-1986 data is compatible with NMFS' trawl survey data, and researchers are able to correlate sightings with fisheries, plankton, and oceanographic data.

Researchers at the Woods Hole Oceanographic Institution designed a comprehensive reference database for marine mammal literature. The database was organized to complement the format used by William E. Schevill for this extensive collection of cetacean literature. The database allows the user to retrieve references based on topic, author, species, geographic region, and taxonomic levels.

LEGAL ACTIONS

Kokechik Fishermen's Ass'n v. Secretary of Commerce, (D.C. Cir. 1988.). In separate suits that were consolidated by the district court, various plaintiffs filed actions against the Secretary challenging an MMPA general permit issued to the Federation of Japan Salmon Fisheries Cooperative (Federation) to take Dall's porpoise incidental to salmon fishing activities in the U.S. EEZ. The permit allowed for the incidental take of Dall's porpoise, but prohibited the take of other marine mammals, including northern fur seals, that would also be taken. The Federation challenged the reduction of quotas on Dall's porpoise from what they had requested and the denial of a permit to incidentally take northern fur seals and sought a preliminary injunction to allow for the incidental take of fur seals. The Center for Environmental Education and other environmental groups, as well as the Kokechik Fishermen's Association (Kokechik) in two other suits, challenged the permit on grounds that the MMPA precluded the issuance of a permit for Dall's porpoise if other marine mammals would inevitably be taken for which a permit could not be issued. The environmental groups and Kokechik also sought a preliminary injunction to enjoin the issuance of the permit to the Federation.

The district court (D.D.C. June 15, 1987) granted the motions for preliminary injunctions filed by the environmental groups and Kokechik and denied the Federation's motion as moot. The court held that as matter of statutory construction, no permit may be issued for Dall's porpoise if it is known that other marine mammals, for which a permit cannot be issued, will also be taken.

The Federation and the Secretary appealed to the U.S. Court of Appeals for the District of Columbia. The Court of Appeals affirmed the

district court on February 16, 1988, holding as a matter of law that the issuance of the permit is contrary to the requirements of the MMPA in that it allowed incidental taking of various species of protected marine mammals without first ascertaining the population of that species was at the optimum sustainable population level. A motion for rehearing and a stay of the injunction filed by the Federation and the Secretary was denied on May 12, 1988. The Solicitor General authorized the filing of a petition for a writ of certiorari to the U.S. Supreme Court on May 25, 1988. The Federation and the Secretary filed motions to stay the injunction with the Court of Appeals and the Supreme Court pending a determination on the petition for writ of certiorari. Both motions were denied.

As a result of this litigation, the Federation chose not to fish for salmon in the U.S. EEZ in 1988.

Greenpeace U.S.A. v. Evans, (W.D. Wash. 1987). This case involved a challenge by Greenpeace and other environmental groups to a scientific research permit issued by NMFS to A. Rus Hoelzel to take dart biopsy samples from killer whales in Puget Sound, Washington. Plaintiffs alleged among other things that the permit was issued illegally because NMFS did not prepare an Environmental Assessment (EA) or an Environmental Impact Statement (EIS), but instead invoked a categorical exclusion as provided by the National Environmental Policy Act (NEPA).

On June 17, 1987, the court considered cross motions for summary judgment and granted Greenpeace's motion on grounds that NMFS violated NEPA by failing to prepare an EA or EIS in light of the existence of factors which indicated

that the proposed research did not qualify for a categorical exclusion.

Japan Whaling Ass'n v. American Cetacean Society 478 U.S. 221 (1986). This action was originally brought in 1984 by environmental groups to restrain the Secretary from entering into an agreement with Japan not to certify its noncompliance with commercial whaling quotas under the Pelly Amendment and the Packwood-Magnuson Amendment. In June 1986, the United States Supreme Court stated that neither the Pelly Amendment nor the Packwood Amendment required the Secretary to certify Japan for refusing to abide by IWC whaling quotas. The Court held that the Secretary had discretion as to whether to certify Japan in order to bring Japan into compliance with quotas set by the International Whaling Commission.

In September, 1987, the original plaintiffs attempted to reopen the case through a motion for relief from judgment on grounds that Japan's proposed "scientific whaling" violated the basis of the Court's finding that the Secretary had adequate justification for withholding certification. The Federal district court denied the motion on the ground that the Supreme Court decision did not hinge upon representations by Japan, but rather on the Secretary's right to consider alternatives to certification.

In January, 1988, the plaintiffs sued the Secretary again to enjoin him to certify Japan based on its 1988 scientific whaling proposal. This case was dismissed by plaintiffs when the Secretary certified Japan for its scientific whaling activities.

Humane Society of the United States v. Verity, (D. District of Columbia). The Humane Society of the United States sued the Secretary of Commerce on December 12, 1987, alleging that he had violated both the MMPA and the Animal Protection Act by reopening the comment period on the proposed rule designating the northern fur seal as depleted under the MMPA. NMFS had reopened the comment period to address what was thought to be new, pertinent data on the fur seal.

On May 18, 1988, NMFS published the final rule designating the northern fur seal as depleted. Judge Richie approved the dismissal of the case on May 20, 1988.

Greenpeace International, Inc. v. Baldrige, (D. Hawaii). On February 20, 1986, Greenpeace and the Sierra Club filed suit challenging NMFS' failure to designate critical habitat for the Hawaiian monk seal within one year of publishing a proposed rule. The 1-year limit is imposed by the Endangered Species Act (ESA), but the lawsuit was brought under both the ESA and the MMPA. On April 25, 1986, NMFS designated critical habitat for the Hawaiian monk seal including beaches, lagoons, and waters surrounding the Northwestern Hawaiian Islands (NWHI) to a depth of 10 fathoms.

In 1983, NMFS approved a recovery plan for the monk seal that included the recommendation that critical habitat be designated out to the 20 fathom isobath around the NWHI. In designating critical habitat to 10 fathoms, NMFS determined that deeper waters did not "require special management considerations or protection" and, therefore, did not fit the definition of critical habitat. Plaintiffs filed an amended complaint on November 4, 1986, to compel designation to 20 fathoms, alleging also that the MMPA imposes a duty on the Federal government to protect the monk seals habitat and that defendants had violated Section 2 of the MMPA (16 U.S.C. 1361(2)) by refusing to designate critical habitat as advised in the recovery plan. Additionally, plaintiffs argued that Section 202 of the MMPA (16 U.S.C. 1402(d)) had been violated because NMFS did not designate critical habitat to beyond 10 fathoms as recommended by the Marine Mammal Commission.

A hearing was held in district court on March 9, 1987, and the Judge issued an order three days later. The court agreed with NMFS that both parts of the definition of critical habitat under the ESA must be satisfied before an area can be properly designated as critical habitat. The court further ruled that whether the 10 to 20 fathom area "may require special management considerations or protection" is a "genuine and material issue of

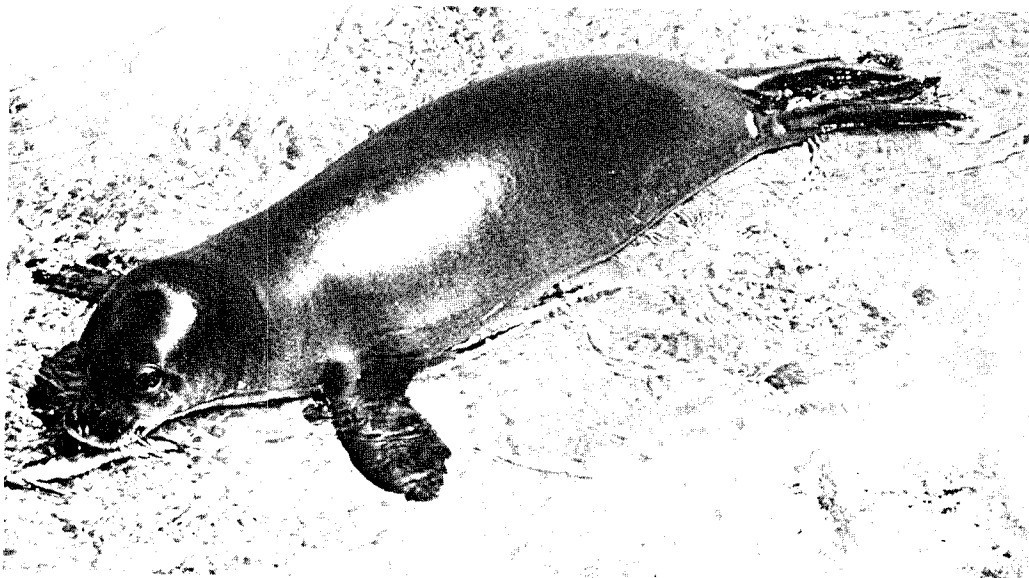
fact" and determined that a trial on that point should be held.

However, NMFS published a final rule designating critical habitat to 20 fathoms on May 26, 1988. On June 27, 1988, a stipulation of dismissal, with prejudice, was signed.

Appendix



Hawaiian monk seals, an adult male and sub-adult female, on French Frigate Shoals, Hawaii. Photo by John Henderson, Southwest Fisheries Center, Honolulu Laboratory, National Marine Fisheries Service.



A prematurely weaned Hawaiian monk seal pup learning to feed in captivity before release to the wild. Photo by John Henderson, Southwest Fisheries Center, Honolulu Laboratory, National Marine Fisheries Service.

TABLE 1: 1987 GENERAL PERMIT AND SMALL TAKE EXEMPTIONS FOR INCIDENTAL TAKE OF MARINE MAMMALS DURING COMMERCIAL FISHING OPERATIONS - 1987

EEZ/Applicant/Category		Otaridiidae				Phocidae					
		Northern sea lion		Northern fur seal		California sea lion		Harbor seal		Elephant seal	
Authorized		Requested	Authorized	Requested	Authorized	Requested	Authorized	Requested	Authorized	Requested	Authorized
Domestic--New											
England Groundfish											
Gillnetters--ST		0	0	0	0	0	0	100	50	0	230f/
Domestic--Menhaden											
Purse Seiners ST		0	0	0	0	0	0	0	0	0	33
NEFC/NMFS	I	0	0	0	0	0	0	0	0	0	15h/
Japan Deep Sea	I	5	0	0	0	0	0	5	0	0	15g/
Germany (GDR)	I	0	0	0	0	0	0	0	0	0	10g/
Italy	I	0	0	0	0	0	0	20	0	0	20
Netherlands	I	0	0	0	0	0	0	5	0	0	10g/
Spain	I	0	0	0	0	0	0	8	0	0	8g/
PACIFIC OCEAN											
(Inside US EEZ)											
Domestic (NPFVO)											
I	1,000	1,000	10	10	0	0	0	10	10	0	10
III	500	300	5	5	0	0	0	200	200	0	10
IV	20	20	5	5	0	0	0	5	5	0	0
V	1,000	750	10	10	0	0	0	1,800	1,200	0	100
Domestic (PCFFA)											
I	10	10	5	5	20	20	20	10	10	10	0
III	0	0	0	0	100	100	100	25	25	0	50b/
IV	0	0	0	0	15	15	15	5	5	0	0
V	50	50	10	10	1,700	1,700	1,700	700	700	50	30c/

TABLE 1: 1987 GENERAL PERMIT AND SMALL TAKE EXEMPTIONS FOR INCIDENTAL TAKE OF MARINE MAMMALS DURING COMMERCIAL FISHING OPERATIONS - 1987

Domestic (Hawaii)	0	0	0	0	0	0	0	0	0	0	H	H	0
Domestic (SAC) VI	0	0	0	0	0	H	H	0	0	0	0	0	0
Japan													
Deepsea I	80	40	10	0	0	0	0	20	20	0	0	0	0
Hokutan I	25	40	5	0	0	0	0	5	5	0	0	0	0
Longline V	0	0	0	0	0	0	0	0	0	0	0	H	H
Salmon V	25	0	450	0	0	0	0	0	0	0	0	5,500	2,942d/
Republic of Korea I	100	25	0	0	0	0	25	100	0	0	0	50	10e/
Poland I													
	90	10	0	0	0	0	0	70	0	0	0	60	5/
People's Republic of China I													
	90	10	0	0	0	0	0	70	0	0	0	60	5
NOTES:													

- a/ Dall's porpoise, harbor porpoise, and beluga whale.
- b/ Pilot whales (30), harbor porpoise (0) Dall's porpoise (5), common (5), whitesided (5) and bottlenosed dolphins (5).
- c/ Pilot whales (10), harbor porpoise (0), Dall's porpoise (10) and whitesided dolphins (10).
- d/ Dall's porpoise; total 6,039 over 3 years.
- e/ Except harbor porpoise.
- f/ Mostly harbor porpoise.
- g/ Total cetacean take by all permit holders fishing in the North Atlantic Ocean may not exceed 622 common dolphins, 711 Atlantic whitesided dolphins, 365 harbor porpoise, 338 Stenella spp., 248 pilot whales, 234 grampus, 172 bottlenose dolphins, and 4 beaked whales.
- h/ Pilot whales (5), harbor porpoise (5), and Atlantic whitesided dolphins (5).

H - Harassment only.
ST - Small Take Exemption.

TABLE 2 - SYNOPSIS OF PERMIT APPLICATIONS
APRIL 1, 1987 TO MARCH 31, 1988

NO. OF APPLICATIONS SUBMITTED	SCIENTIFIC RESEARCH	PUBLIC DISPLAY	SCIENTIFIC AND PUBLIC DISPLAY	AS OF March 31, 1988	
				TOTAL	
NO. OF ANIMALS REQUESTED (TOTAL) OF THESE:	36	29	0	65	
TAKEN BY KILLING					
TAKEN AND KEPT ALIVE	806	0	0	806	
KILLED IN CAPTIVITY	9	81	0	81	
TAKEN AND RELEASED	0	0	0	0	
FOUND DEAD	184,296	0	0	184,296	
STRANDED/EXCHANGED	0	2	0	0	
IMPORTS	0	34	0	34	
HARASS	9	36	0	45	
	62,745	0	0	62,745	
ACTION TAKEN					
NO. OF APPLICATIONS FORWARDED TO MARINE MAMMAL COMMISSION	30	22	0	50	
NO. APPLICATIONS REVIEWED BY MARINE MAMMAL COMMISSION	28	21	0	49	
NO. APPLICATIONS WITHDRAWN	3	0	0	3	
NO. OF APPLICATIONS REFERRED TO FISH AND WILDLIFE	0	0	0	0	
NO. OF APPLICATIONS REFERRED TO STATES	0	0	0	0	
NO. OF APPLICATIONS REFERRED TO REGIONS	0	0	0	0	
NO. OF APPLICATIONS RESOLVED THROUGH AGREEMENT	0	0	0	0	
NO. OF APPLICATIONS RETURNED DUE TO INSUFFICIENT OR INAPPROPRIATE SUBMITTAL	6	4	0	10	
NO. APPLICATIONS DENIED	1	0	0	1	
NO. OF APPLICATIONS APPROVED	22	16	0	38	
NO. OF APPLICATIONS PENDING	2	6	0	8	

TABLE 5 - NUMBER OF CETACEANS AUTHORIZED IN SCIENTIFIC RESEARCH/PUBLIC DISPLAY
 PERMIT APPLICATIONS
 APRIL 1, 1987 THRU MARCH 31, 1988

	TAKEN BY KILLING	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR TAKEN AND RELEASED	FOUND DEAD/ STRANDED	TOTAL REQUESTED
ATLANTIC WHITE-SIDED DOLPHIN	-----	-----	-----	-----	-----	0
BLACK RIGHT WHALE, NORTHERN RIGHT	-----	-----	-----	-----	-----	0
BLUE WHALE	-----	-----	-----	10	-----	10
BOTTLENOSE DOLPHIN	-----	53	-----	-----	-----	53
BOWHEAD WHALE	-----	-----	-----	-----	-----	0
BRYDE'S WHALE	-----	-----	-----	-----	-----	0
COMMONERSON'S DOLPHIN	-----	-----	-----	-----	-----	0
COMMON DOLPHIN	-----	-----	-----	-----	-----	0
DALL'S PORPOISE	-----	-----	-----	-----	-----	0
DUSKY DOLPHIN	-----	-----	-----	-----	-----	0
FALSE KILLER WHALE	-----	14	-----	-----	-----	14
FIN WHALE, FINBACK	-----	-----	-----	-----	-----	0
FRASER'S (sarawak) DOLPHIN	-----	-----	-----	-----	-----	0
GRAY WHALE	-----	-----	-----	200	-----	200
HARBOR PORPOISE	-----	-----	-----	-----	-----	0
HUMPBACK WHALE	-----	-----	-----	165	-----	165
KILLER WHALE	-----	1	-----	-----	-----	1
LONG-FINNED PILOT WHALE	-----	-----	-----	-----	-----	0
MELON-HEADED WHALE, ELECTRA	-----	-----	-----	-----	-----	0
MINKE WHALE	-----	-----	-----	-----	-----	0
NORTHERN RIGHT WHALE DOLPHIN	-----	-----	-----	-----	-----	0
PACIFIC WHITE-SIDED DOLPHIN	-----	4	-----	-----	-----	4
PILOT WHALES UNSPECIFIED	-----	-----	-----	-----	-----	0
PYGMY KILLER WHALE	-----	-----	-----	-----	-----	0
PYGMY RIGHT WHALE	-----	-----	-----	-----	-----	0
RISSE'S DOLPHIN, GRAMPUS	-----	8	-----	-----	-----	8
ROUGH-TOOTHED DOLPHIN	-----	-----	-----	-----	-----	0
SEI WHALE	-----	-----	-----	-----	-----	0
SHORT-FINNED PILOT WHALE	-----	-----	-----	-----	-----	0

TABLE 5 - NUMBER OF CETACEANS AUTHORIZED IN SCIENTIFIC RESEARCH/PUBLIC DISPLAY
 PERMIT APPLICATIONS
 APRIL 1, 1987 THRU MARCH 31, 1988

SOUTHERN RIGHT WHALE	-----	-----	-----	-----	-----	0
SPERM WHALE	-----	-----	-----	-----	-----	0
SPINNER DOLPHIN	-----	-----	-----	-----	-----	0
SPOTTED DOLPHIN	-----	-----	-----	-----	-----	0
STENELLINE DOLPHINS	-----	-----	-----	-----	-----	
STRIPED DOLPHIN, STREAKER	-----	-----	-----	-----	-----	
UNSPECIFIED CETACEANS	-----	-----	-----	-----	-----	
Vaquita, COCHITO	-----	-----	-----	-----	-----	
WHITE WHALE, BELUKHA	-----	15	-----	-----	-----	15
WHITE-BEAKED DOLPHIN	-----	-----	-----	-----	-----	
TOTALS:	0	95	0	375	0	470

(1) SPECIMEN IMPORTS AND HARASSMENT ACTIVITIES NOT INCLUDED IN THIS TABLE.
 (2) WHERE A PERMIT SPECIFIED THE TOTAL NUMBER OF ANIMALS TO BE TAKEN WITHOUT SPECIFYING THE NUMBER
 TO BE TAKEN FROM A PARTICULAR SPECIES, THE NUMBER AUTHORIZED WAS LISTED UNDER SPECIFIED CETACEA.

TABLE 6 - NUMBER OF PINNIPEDS AUTHORIZED IN SCIENTIFIC RESEARCH/PUBLIC DISPLAY
 PERMIT APPLICATIONS
 APRIL 1, 1987 THRU MARCH 31, 1988

	TAKEN BY	TAKEN AND KEPT ALIVE	KILLED IN CAPTIVITY	TAGGED OR TAKEN AND RELEASED	FOUND DEAD/ STRAND	TOTAL REQUESTED
ARCTOCEPHALINE FUR SEALS	-----	-----	-----	-----	-----	0
BAIKAL SEAL	-----	-----	-----	-----	-----	0
BEARDED SEAL	300	-----	-----	-----	-----	300
CALIFORNIA SEA LION	-----	1	-----	-----	4	5
CASPIAN SEAL	-----	-----	-----	-----	-----	0
CRABEATER SEAL	-----	-----	-----	-----	-----	0
GRAY SEAL	-----	-----	-----	-----	-----	0
HARBOR SEALS	200	-----	-----	1,075	-----	1,275
HARP SEAL, GREENLAND SEAL	-----	-----	-----	-----	-----	0
HAWAIIAN MONK SEAL	-----	-----	-----	300	-----	300
KERGUELEN FUR SEAL	-----	-----	-----	-----	-----	0
LARGHA SEAL, SPOTTED SEAL	100	-----	-----	-----	-----	100
LEOPARD SEAL	-----	-----	-----	-----	-----	0
NORTHERN ELEPHANT SEAL	-----	-----	-----	-----	-----	0
NORTHERN FUR SEAL	400	-----	-----	200,000	-----	200,400
NORTHERN SEA LION/STELLER SEA LION	200	-----	-----	5,000	-----	5,200
RIBBON SEAL	100	-----	-----	-----	-----	100
RINGED SEAL	100	-----	-----	-----	-----	100
ROSS SEAL	-----	-----	-----	-----	-----	0
SOUTH AFRICAN FUR SEAL	-----	-----	-----	-----	-----	0
SOUTH AMERICAN SEA LION	-----	-----	-----	-----	-----	0
SOUTHERN ELEPHANT SEAL	-----	-----	-----	-----	-----	0
UNSPECIFIED MARINE MAMMALS	-----	-----	-----	-----	-----	0
UNSPECIFIED PINNIPEDS	-----	-----	-----	-----	-----	0
WALRUS	-----	-----	-----	-----	-----	0
WEDDELL SEAL	-----	-----	-----	1,320	-----	1,320
TOTALS: (2)	1,400	1	0	207,695	4	209,100

(1) SPECIMEN IMPORTS AND HARASSMENT ACTIVITIES NOT INCLUDED IN THIS TABLE.

(2) WHERE A PERMIT SPECIFIED THE TOTAL NUMBER OF ANIMALS TO BE TAKEN WITHOUT SPECIFYING THE NUMBER

TABLE 7 - SUMMARY OF ALL PERMITS FOR PERMANENT REMOVAL FROM THE WILD - CETACEANS FROM 1973 THRU MARCH 31, 1988

SPECIES	***** PERMITS *****										*****NUMBER OF ANIMALS*****									
	ISSUED	EXPIRED	CURRENT	REQUESTED	AUTHORIZED	REPLACEMENTS	AUTHORIZATION	TAKEN	TAKE		EXPIRED	(1)	REMAINING							
ATLANTIC WHITE SIDED DOLPHIN	2	2	0	6	6	0	6	0	0											
BOTTLENOSE DOLPHIN	126	109	17	686	656	37	144	455	57											
COMMERSON'S DOLPHIN	1	1	0	12	12	0	0	12	0											
COMMON DOLPHIN	7	7	0	181	173	5	151	27	0											
DALL'S PORPOISE	1	1	0	960	960	0	960	0	0											
FALSE KILLER WHALE	11	6	5	34	34	0	7	15	12											
FRASER'S (SARAWAK) DOLPHIN	3	3	0	70	70	0	70	0	0											
HARBOR PORPOISE	2	2	0	6	6	0	6	0	0											
KILLER WHALE	9	7	1	24	22	0	10	12	0											
LONG-FINNED PILOT WHALE	1	1	0	2	2	0	2	0	0											
MELON-HEADED WHALE, ELECTRA	4	4	0	49	49	0	47	2	0											
PACIFIC WHITE-SIDED DOLPHIN	7	5	2	35	35	0	20	3	12											
PYGMY KILLER WHALE	5	5	0	53	49	0	49	0	0											
RISSEO'S DOLPHIN, GRAMPUS	7	5	2	88	86	0	77	1	8											
ROUGH-TOOTHED DOLPHIN	5	5	0	79	79	2	79	2	0											
SHORT-FINNED PILOT WHALE	13	13	0	101	98	3	81	17	0											
SPINNER DOLPHIN	4	4	0	2,956	2,950	3	2,779	174	0											
SPOTTED DOLPHIN	3	3	0	4,935	4,935	0	4,676	259	0											
STRIPED DOLPHIN, STREAKER	1	1	0	100	100	0	100	0	0											
UNSPECIFIED CETACEANS	4	4	0	383	383	0	383	0	0											
WHITE WHALE, BELUKHA	15	10	5	71	70	1	26	36	8											
WHITE-BEAKED DOLPHIN	1	1	0	2	2	0	2	0	0											
TOTAL NUMBER OF ANIMALS:				10,833	10,777	51	9,675	1,015	97											

(1) ANIMALS TAKEN INCLUDE THOSE INADVERTENTLY KILLED DURING THE COURSE OF RESEARCH AUTHORIZING TYPES OF TAKE OTHER THAN PERMANENT REMOVAL.

TABLE 8 - SUMMARY OF ALL PERMITS FOR PERMANENT REMOVAL FROM THE WILD - PINNIPEDS FROM 1973 THRU MARCH 31, 1988

SPECIES	***** PERMITS *****				*****NUMBER OF ANIMALS*****				*****		
	ISSUED	EXPIRED	CURRENT	REQUESTED	AUTHORIZED	REPLACEMENTS	AUTHORIZATION	TAKEN	TAKE	REMAINING	
							EXPIRED	(1)			
ARCTOCEPHALINE FUR SEALS	1	1	0	2	2	0	2	0	0	0	
BAIKAL SEAL	2	2	0	8	8	0	4	4	0	0	
BEARDED SEAL	10	8	2	1,430	1,430	0	953	179	298		
CALIFORNIA SEA LION	82	81	1	869	855	13	577	276	2		
CASPIAN SEAL	1	1	0	2	2	0	2	0	0	0	
CRABEATER SEAL	9	8	1	15,798	15,798	0	12,962	499	2,337		
GRAY SEAL	5	5	0	28	26	0	10	16	0	0	
HARBOR SEAL	38	36	2	8,278	2,012	0	979	792	241		
HARP SEAL , GREENLAND SEAL	1	1	0	40	40	0	20	20	0	0	
HAWAIIAN MONK SEAL	2	1	1	20	20	0	1	1	18		
KERGUELEN FUR SEAL	3	3	0	151	151	0	151	0	0	0	
LARGHA SEAL , SPOTTED SEAL	7	6	1	1,120	1,120	0	923	97	100		
LEOPARD SEAL	8	8	0	776	776	0	661	115	0	0	
NORTHERN ELEPHANT SEAL	4	4	0	162	160	0	133	27	0	0	
NORTHERN FUR SEAL	4	3	1	2,710	420	0	1	31	388		
NORTHERN SEA LION, STELLER SEA LION	9	8	1	1,060	1,060	0	292	573	195		
RIBBON SEAL	9	8	1	930	930	0	752	78	100		
RINGED SEAL	12	10	2	1,520	1,520	0	1,076	342	102		
ROSS SEAL	6	6	0	289	289	0	286	3	0	0	
SOUTH AMERICAN SEA LION	4	3	1	16	16	0	4	8	4		
SOUTHERN ELEPHANT SEAL	5	4	1	153	153	0	153	0	0	0	
UNSPECIFIED MARINE MAMMALS	1	1	0	0	15	0	11	4	0	0	
UNSPECIFIED PINNIPEDS	1	1	0	12	12	3	12	0	0	0	
WALRUS	2	2	0	400	200	0	20	180	0	0	
WEDDELL SEAL	10	10	0	716	716	0	641	75	0	0	

TOTAL NUMBER OF ANIMALS:

36,490 27,731 16 20,626 3,320 3,785

(1) ANIMALS TAKEN INCLUDE THOSE INADVERTENTLY KILLED DURING THE COURSE OF RESEARCH AUTHORIZING TYPES OF TAKE OTHER THAN PERMANENT REMOVAL.

TABLE 9. POPULATION ESTIMATES: CETACEA

Name	Estimated World Total	Comparison of Population Data	Arctic Circumpolar	(Asia Alaska North America)	(South America)	(North Europe Africa)	(Atlantic)	(New Zealand)	(Sub Arctic)	(Antarctic)
Order: Cetacea										
Suborder: Mysticeti										
Family: Eschrichtiidae										
Gray whale (<u>Eschrichtius robustus</u>)	18,000/ best			18,000/						
Family: Balaenopteridae										
Minke whale (<u>Balaenoptera acutorostrata</u>)	315,800/ 331,800	incomplete		13,500 + ²	+	44,000/ 60,000			258,300	
Sei whale (<u>Balaenoptera borealis</u>)	48,000 63,000	incomplete		<-----22,000/37,000----->		2,600	2,000/ +	+		24,000
Bryde's whale (<u>Balaenoptera edeni</u>)	30,200/ 55,500	incomplete		14,600/ 39,900	+	15,600	+	+	+	
Fin whale (<u>Balaenoptera physalus</u>)	105,200/ 121,900	incomplete		<-----14,600/18,600----->		3,600/ 6,300	2,000/ 12,000		<-----85,000----->	
Blue whale (<u>Balaenoptera musculus</u>)	11,700	incomplete		<-----1,600----->		100	+	+	<-----10,000----->	
Humpback whale (<u>Megaptera novaeangliae</u>)	9,500/ 10,000	incomplete		<-----1,200----->		5,800	"few hundred"	+	<-----2,500/3,000----->	
Family: Balaenidae										
Right whale (<u>Balaena glacialis</u>)	3,100/ 3,200	incomplete		100/ 200			"few hundred"	+	<-----3,000----->	
Bowhead whale (<u>Balaena mysticetus</u>)	7,800	complete	+	7,800						

TABLE 9. CONTINUED. POPULATION ESTIMATES: CETACEA

Name	Estimated World Total	Comparison of Population Data	Arctic Circumpolar	(	PACIFIC	)	(	ATLANTIC	)	(	SOUTHERN OCEAN)
Order: Cetacea				()	()	()
Suborder: Odontoceti				(	Asia	North America	(	North America	)	(	South America)
Family: Delphinidae				(	Alaska	South America	(	Europe	)	(	Africa)
				(			(		)	(	New Zealand)
				(			(		)	(	Sub arctic)
				(			(		)	(	Ant- arctic)
Atlantic white-sided dolphin (<u>Legionorhynchus acutus</u>)	no data	Incomplete						24,000	+			
Pacific white-sided dolphin (<u>Legionorhynchus obliquidens</u>)	no data	Incomplete		+		30,000/ 50,000						
Northern right whale dolphin (<u>Lissodelphis borealis</u>)	no data	Incomplete		+	+	+						
Southern right whale dolphin (<u>Lissodelphis peronii</u>)	no data	Incomplete								+	+	+
Risso's dolphin (<u>Grampus griseus</u>)	no data	Incomplete		+	+	+	10,000	+	+	+		
Melon-headed whale (<u>Peponocephala electra</u>)	no data	Incomplete			+							
Pygmy killer whale (<u>Feresa attenuata</u>)	no data	Incomplete			+		+	+	+	+		
False killer whale (<u>Pseudorca crassidens</u>)	no data	Incomplete		+	+	+	+	+	+	+	+	+
Long-finned pilot whale (<u>Globicephala melaleuca</u>)	no data	Incomplete					+	+				
Short-finned pilot whale (<u>Globicephala macrorhynchus</u>)	no data	Incomplete			+	+	+	+	+	+		
Killer whale (<u>Orcinus orca</u>)	no data	Incomplete	+	+	+	+	+	+	+	+	+	+
Rough-toothed dolphin (<u>Steno bredanensis</u>)	no data	Incomplete			+	+	+	+	+	+		
Bottlenose dolphin (<u>Tursiops truncatus</u>)	no data	Incomplete		+	+	+	14,000/ 23,000	+	+	+		
Spinner dolphin (<u>Stenella longirostris</u>)	no data	Incomplete		+	900,000		+	+	+	+		
Spotted dolphin (<u>Stenella attenuata</u>)	no data	Incomplete		+	2.2 Mil							
Atlantic spotted dolphin (<u>Stenella plagiodon</u>)	no data	Incomplete					+	+	+	+		
Striped dolphin (<u>Stenella coeruleoalba</u>)	no data	Incomplete		+	2.3 Mil		+					
Common dolphin (<u>Delphinus delphis</u>)	no data	Incomplete		+	900,000		31,000	+	+	+	+	+
Fraser's dolphin (<u>Legionorhynchus hosei</u>)	no data	Incomplete			+			+				

TABLE 9. CONTINUED. POPULATION ESTIMATES: CETACEA

Name Order: Cetacea Suborder: Odontoceti	Estimated World Total	Comparison of Population Data	Arctic Circum- polar	PACIFIC			ATLANTIC			SOUTHERN OCEAN				
				Asia	Alaska	North America	South America	North America	Europe	Africa	South America	New Zealand	Aus- tralia	Sub Ant- arctic
Family: Phocoenidae Harbor porpoise (<u>Phocoena phocoena</u>)	no data	Incomplete		+	+	+		18,000	+					
Dall's porpoise (<u>Phocoenoides dalli</u>)	2,150,000	complete		<----- 2,150,000 ----->										
Family: Monodontidae Beluga, belukha, white whale (<u>Delphinapterus leucas</u>)	62,000/ 88,000	complete	62,000/ 88,000	+	+	+		+						
Narwhal (<u>Monodon monoceros</u>)	30,000	Incomplete	30,000	+	+	+		+						
Family: Physeteridae Sperm whale (<u>Physeter macrocephalus</u>)	982,200	complete		198,000	<-----274,000----->			<-----99,500----->			+	<-----410,700----->		
Pygmy sperm whale (<u>Kogia breviceps</u>)	no data	Incomplete		+	+	+	+	+		+	+			
Dwarf sperm whale (<u>Kogia simus</u>)	no data	Incomplete		+	+	+	+	+		+	+			
Family: Ziphiidae Baird's beaked whale (<u>Berardius bairdii</u>)	no data	Incomplete		+	+	+						+	+	+

¹Best = the most comprehensive estimates throughout the range of the species.
Complete = good population estimates throughout the range of the species.
²Incomplete = population estimates only in parts of the range of the species.
³Although a population occurs in this area, the numbers are either unknown or the data are not available.

TABLE 10. POPULATION ESTIMATES: PINNIPEDIA¹

Name Order: Suborder: Family:	Carnivora Pinnipedia Otariidae	Estimated World Total	Comparison of Population Data ²	Arctic Circum- polar	PACIFIC				ATLANTIC			SOUTHERN OCEAN		
					Alaska	North America	South America	North America	Europe	Africa	South America	New Zealand	Aus- tralia	Sub Ant- arctic
California sea lion (<u>Zalophus californianus</u>)		177,000	complete			157,000	20,000							
Northern sea lion (<u>Eumetopias jubatus</u>)		95,000/ 122,000	complete		5,000/ 7,000	80,000/ 105,000								
South American sea lion (<u>Otaria flavescens</u>)		273,000	complete				228,000				45,000			
Australian sea lion (<u>Neophoca cinerea</u>)		2,000/ 3,000	complete										2,000/ 3,000	
Hooker's (New Zealand) sea lion (<u>Phocartos hookeri</u>)		6,000										6,000		
Alaska or Northern fur seal (<u>Callorhinus ursinus</u>)		1,151,000	best		332,000	815,000	4,000							
Guadalupe fur seal (<u>Arctocephalus townsendi</u>)		1,600	complete				1,600							
Juan Fernandez fur seal (<u>Arctocephalus philippii</u>)		705/ 750	complete				705/ 750							
Galapagos fur seal (<u>Arctocephalus galapagoensis</u>)		1,000/ 5,000	incomplete				1,000/ 5,000							
South American fur seal (<u>Arctocephalus australis</u>)		346,000	incomplete				294,000				52,000			
Cape (South African) and Australian fur seals (<u>Arctocephalus pusillus</u>)		870,000	complete							850,000			20,000	

TABLE 10. CONTINUED. POPULATION ESTIMATES: PINNIPEDIA¹

Name	Order:	Suborder:	Family:	Comparison of Population Data ²	Estimated World Total	Arctic Circumpolar	PACIFIC				ATLANTIC				SOUTHERN OCEAN			
							Asia	Alaska	North America	South America	North America	Europe	Africa	South America	New Zealand	Aus-tralia	Sub Ant-arctic	Ant-arctic
Bearded seal (<u>Erignathus barbatus</u>)				incomplete	exceeds 500,000		exceeds 500,000											
Hooded seal (<u>Cystophora cristata</u>)				complete	500,000/ 600,000							500,000/ 600,000						
Mediterranean monk seal (<u>Monachus monachus</u>)				best	500							500						
Caribbean monk seal (<u>Monachus tropicalis</u>)				best	extinct or near extinct													
Hawaiian monk seal (<u>Monachus schauinslandi</u>)				complete	500/ 1,500				500/ 1,500									
Southern elephant seal (<u>Mirounga leonina</u>)				complete	600,000										300,000			
Northern elephant seal (<u>Mirounga angustirostris</u>)				best	100,000				100,000									
Crabeater seal (<u>Lobodon carcinophaga</u>)				best	15,000,000													15,000,000
Ross seal (<u>Ommatophoca rossii</u>)				complete	220,000													220,000
Leopard seal (<u>Hydrurga leptonyx</u>)				complete	500,000													500,000
Weddell seal (<u>Leptonychotes weddellii</u>)				complete	750,000													750,000

¹All species of pinnipeds are included in the tables because of available data.

²Best = The most comprehensive estimates throughout the range of the species.

Complete = good population estimates throughout the range of the species.

Incomplete = population estimates only in parts of the range of the species.

RECENT PUBLICATIONS AVAILABLE FROM NMFS REGIONS AND CENTERS

ADDRESS:

National Marine Fisheries Service
Southeast Fisheries Center
75 Virginia Beach Drive
Miami, Florida 33149

Burn, D.M. 1987. Progress report of bottlenose dolphin beach surveys in the mid-Atlantic region. NOAA/NMFS/SEFC/Miami Laboratory Contribution CRD-87/88-09. 18 pp.

Hansen, L.J. in press. California coastal bottlenose dolphins. In S. Leatherwood and R.R. Reeves (eds.), Selected papers on bottlenose dolphins. San Diego, Academic Press.

Hersh, S.L. 1987. Stock structure of bottlenose dolphins (genus Tursiops) in the southeastern U.S.: a review and management considerations. Final Report, NOAA/NMFS/SEFC, Contract 40GENF700715. 35 pp.

Scott, G.P. in press. Management oriented research on bottlenose dolphins in the Southeast U.S. In S. Leatherwood and R.R. Reeves, (ed.), Selected papers on bottlenose dolphins. San Diego, Academic Press.

Scott, G.P. and D.M. Burn. 1987. The potential impact of the 1987 mass mortality on the mid-Atlantic off-shore stock of bottlenose dolphins. NOAA/NMFS/SEFC/Miami Laboratory Contribution CRD-87/88-10. 20 pp.

ADDRESS:
National Marine Fisheries Service
Northeast Fisheries Center
Woods Hole, Massachusetts 02543

Anonymous, 1987. Cruise results NOAA R/V GLORIA MICHELLE Cruise No. GM 87-11, NMFS/NEFC Woods Hole, MA. 7pp.

Clapham, P.J. 1987 (Ed.). North Atlantic Fin Whale Research. Proceeding of a meeting to review methodology and to coordinate information exchange, 24 October 1986, Provincetown, MA. 25pp.

CRWRP. 1987. NMFS/URI/NEA/CCS/WHOI cooperative right whale research program, "Integrated Program for Research on the Northern Right Whale off the Eastern United States, "six-month progress report - number 1, 1 October 1986 - 31 March 1987, to NMFS/NEFC, Cooperative Agreement No. NA-86j-EA-H-00053, Woods Hole, MA, 29pp.

Katona, S.K., and J.A. Beard. 1987. The Humpback Whale Fluke Catalogue: Final Rept. to NMFS/NEFC, Contract NO. 40-EANF-7000314, Woods Hole, MA, 24pp.

Lambertsen, R.H., and D.A. Duffield. 1987. Biopsy studies of the humpback whale, Megaptera novaeangliae. Final Rept. to NMFS/NEFC, Contract NO. 50-EANF-00094, Woods Hole, MA, 72 pp.

Mayo, C.A., D.K. Mattila, S. Pittman, and L. Baraff. 1987. Abundance, distribution, and habitat use of large whales in the southern Gulf of maine: May 1 - September 30, 1986. Annual Rept. to NMFS/NEFC, Contract No. 50-EANF-5-00130, Woods Hole, MA, 145pp.

Stone, G.S., A. Mainwaring, and J.A. Beard. 1987. Surfacing, Respiration, and Dive Characteristics of finback whales (Balaenoptera physalus) observed from Mount Desert Rock, Maine. Final Rept. to NMFS/NEFC, Contract NO. 40-EANF-501300, Woods Hole, MA, 18 pp.

ADDRESS:

Southwest Region
300 South Ferry Street
Terminal Island, California 90731-7415

Hanan, D.A., L.M. Jones, 1988. Harbor Porpoise (phocoena phocoena), Aerial Survey, October 26 to November 20, 1987, Final REport, NMFS, SWR. Coop. Agreement No. 86ABH00018, 29pp.

Seagars, D.J., 1988. The fate of Released, Rehabilitated Pinnipeds based on Tag-Resighting Information: A Preliminary Assessment. NMFS,, SWR Administrative Report, SWR 88-1, 31 pp.

Hanan, D.A., J.P. School, S. Diamond, 1988. Harbor Seal (Phoca vitulina), Census in California, May-June, 1987. NMFS, SWR Administrative Report, SWR 88-2, 49pp.

ADDRESS:
National Marine Fisheries Service
Southwest Fisheries Center
P.O. Box 271
La Jolla, California 92038

- Amstrup, S. C., and D. P. DeMaster. 1988. A biological account of polar bear populations in areas under U.S. jurisdiction, with research and management recommendations. 39-56. IN: Selected marine mammals of Alaska. (editor J. Lentfer). Marine Mammal Commission Spec. Publ. 275pp.
- Antonelis, G. A., Jr., M. S. Lowry, D. P. DeMaster, and C. H. Fiscus. 1987. Assessing northern elephant seal feeding habits by stomach lavage. Mar. Mamm. Sci. 3(4):308-322.
- Barlow, J., C.W. Oliver, T.D. Jackson and B.L. Taylor. 1988. Population density estimates for harbor porpoise (Phocoena phocoena) based on aerial surveys at California, Oregon and Washington coasts. Fish. Bull. (in press).
- Barlow, J. 1988. Harbor porpoise (Phocoena phocoena) abundance estimation for California, Oregon and Washington: I. Ship surveys. Fish. Bull. (in press).
- Barlow, J. 1988. Harbor porpoise (Phocoena phocoena) abundance estimation for California, Oregon and Washington: II. Aerial surveys. Fish. Bull. (in press).
- Bernard, H. J. and A. A. Hohn. 1988. Differences in feeding habits between pregnant and lactating spotted dolphins (Stenella attenuata). J. Mamm. (in press).
- Bernard, H.J. and A.A. Hohn. 1988. Feeding habit differences between pregnant and lactating spotted dolphins in the eastern tropical Pacific Ocean. J. Mammalogy. (in press).
- Boveng, P. 1988. Status of the northern elephant seal population on the U. S. west coast. Southwest Fisheries Center Administrative Report LJ-88-05.
- Boveng, P. 1988. Status of the Pacific harbor seal population on the U. S. west coast. Southwest Fisheries Center Administrative Report LJ-88-06.
- Boveng, P. 1988. Status of the California sea lion population on the U. S. west coast. Southwest Fisheries Center Administrative Report LJ-88-07.
- Boveng, P., D. DeMaster, and B. Stewart. 1988. Dynamic response analysis. III. A consistency filter and application to four northern elephant seal colonies. Marine Mammal Science 4(3)000-000. (July 1988)

- Chivers, S.J., A.A. Hohn, and R.B. Miller. 1988. Composition of the incidental kill of small cetaceans in the US purse-seine fishery for tuna in the eastern tropical Pacific during 1987. Rep. Int. Whal. Commn 39. (in press).
- DeMaster, D. P., and J. K. Drevenak. 1988. Survivorship patterns in three species of captive cetaceans. Mar. Mamm. Science (in press).
- Fiedler, P.C. 1988. Surface manifestations of subsurface thermal structure in the California Current. J. Geophys. Res. 93(C5): 4975-4984.
- Fiedler, P. C. and H. J. Bernard. 1987. Tuna aggregation and feeding near fronts observed in satellite imagery. Cont. Shelf Res., 7 (8) :871-881.
- Hohn, A.A. 1988. Reading between the lines: an analysis of age estimation in dolphins. IN: Reeves, R. and S. Leatherwood, eds. Selected Papers on Bottlenose Dolphins, Tursiops spp. Academic Press. (in press).
- Hohn, A.A., H.J. Bernard, and R. Miller. 1988. Metodos de recoleccion y analisis de muestras del ciclo biologico de los delfines. (Methods of collection and analysis of dolphin life history samples). IN: O. Vidal and J. Urban, eds. Memorias de la XI Reunion Internacional sobre Mamiferos Marinos. (in press).
- Hohn, A.A., M.D. Scott, R.W. Wells, J. Sweeney, and A.B. Irvine. 1988. Growth layers in teeth from free-ranging, known-age bottlenose dolphins. Mar. Mamm. Sci. (in press).
- Holt, R. S. 1987. Estimating density of dolphin schools in the eastern tropical Pacific ocean by line transect methods. Fish. Bull. 85(3)419-434.
- Holt, R. S. and J. B. Cologne. 1987. Factors affecting line transect estimates of dolphin school density. J. Wildl. Manage. 51(4):836-873.
- Holt, R. S., T. Gerrodette, and J. B. Cologne. 1987. Research vessel survey design for monitoring dolphin abundance in the eastern tropical Pacific. Fish. Bull. 85(3):435-446.
- Holt, R. S. and A. Jackson. 1987. Report of a marine mammal survey of the eastern tropical Pacific aboard the Research Vessel McArthur July 29 - December 6, 1986. U.S. Dep. Commer., NOAA-TM-NMFS-SWFC-77. 161 pp.

- Holt, R. S. and S. N. Sexton. 1987. Report of a marine mammal survey of the eastern tropical Pacific aboard the Research Vessel David Starr Jordan July 29 - December 5, 1986. U.S. Dep. Commer., NOAA-TM-NMFS-SWFC-76. 171 pp.
- Myrick, A.C., P.K. Yochem, and L.H. Cornell. 1988. Toward calibrating dentinal layers in captive killer whales by use of tetracycline labels. *Rit. Fiskideilar.* (in press).
- Lowry, M. S., L. Hansen and S. Hawes. 1987. California sea lion and northern elephant seal pup counts and tagging at Santa Barbara Island, California, from June 1983 through July 1986. Southwest Fisheries Center Administrative Report LJ-87-03.
- Lowry, M. S. and R. L. Folk. 1987. Feeding habits of California sea lions from stranded carcasses collected at San Diego county and Santa Catalina Island, California. Southwest Fisheries Center Administrative Report LJ-87-15.
- Oliver, C.W., M.S. Lowry and L.M. Ferm. 1988. Pinniped studies conducted at San Clemente Island, California during 1983. SWFC Admin. Rept. No. LJ-88-08, 47pp.
- Oliver, C.W. and T.D. Jackson. 1987. Occurrence and distribution of marine mammals at sea from aerial surveys conducted along the US west coast between December 15, 1980 and December 17, 1985. SWFC Admin. Rept. No. LJ-87-19, 189pp.
- Oliver, C.W. and M.S. Lowry. 1987. Pinniped studies conducted between August, 1981 and December 1982 at San Clemente Island, California. SWFC Admin. Rept. No. LJ-87-23, 47pp.
- Perrin, W.F. and A.A. Hohn. 1988. *Stenella attenuata*. In Harrison, R., and S. Ridgway, ed. *Handbook of Marine Mammals*. (in press).
- Pitman, R.L., A. Aguayo L. and J. Urban R. 1987. Observations of an unidentified beaked whale (Mesoplodon sp.) in the eastern tropical Pacific. *Mar. Mam. Sci.* 3(4): 345-352.
- Polacheck, T. 1987. Relative abundance, distribution and inter-specific relationship of cetacean schools in the eastern tropical Pacific. *Mar. Mam. Sci.* 3(1): 54-77.
- Reilly, S.B. 1987. Reanalysis of rate of change in the California-Chukotka gray whale stock, 1967/68 - 1979/80. *Rep. int. Whal. Commn* 37: 347-349.
- Reilly, S.B. 1987. Tuna vessel observer data research plan for FY-1987 and beyond. SWCF Admin. Rept. LJ-87-11: 47pp.

- Scott, M.D. and S.J. Chivers. 1988. Distribution and herd structure of bottlenose dolphins in the eastern tropical Pacific Ocean. IN: Reeves, R. and S. Leatherwood, eds. Selected Papers on Bottlenose Dolphins, Tursiops spp. Academic Press. (in press).
- Southern, S.O., P.J. Southern, and A.E. Dizon. 1988. Molecular characterization of a cloned dolphin mitochondrial genome. J. of Mole. Evol. (in press).
- Taylor, M.K., D.P. DeMaster, F.L. Burnell, and R.E. Schweinsburg. 1987. Modeling the sustainable harvest of female polar bears. J. Wildl. Manage. 51(4):811-820.
- Thayer, V.G., S.B. Reilly, P.C. Fiedler, R.L. Pitman, G.G. Thomas and D.W. Behringer. 1988. Report of ecosystem studies conducted during the 1987 eastern tropical Pacific dolphin survey on the research vessel David Starr Jordan. NOAA Tech. Memo. NMFS-SWFC-114, 112pp.
- Thayer, V.G., S.B. Reilly, P.C. Fiedler, C.W. Oliver and D.W. Behringer. 1988. Report of ecosystem studies conducted during the 1987 eastern tropical Pacific dolphin survey on the research vessel McArthur. NOAA Tech. Memo. NMFS-SWFC-115, 112pp.
- Thayer, V.G., B.G. McDonald, J.M. Ellingson, C.W. Oliver, D.W. Behringer and S.B. Reilly. 1987. Report of ecosystem studies conducted during the 1986 eastern tropical Pacific dolphin survey on the research vessel McArthur. NOAA Tech. Memo. NMFS-SWFC-104, 112pp.
- Thayer, V.G., R.L. Pitman, K.A. Rittmaster, G.G. Thomas, D.W. Behringer and S.B. Reilly. 1987. Report of ecosystem studies conducted during the 1986 eastern tropical Pacific dolphin survey on the research vessel David Starr Jordan. NOAA Tech. Memo. NMFS-SWFC-105, 106pp.
- Whalen, B.E., R.B. Miller, and S.J. Ladiana. 1988. Composition of the incidental kill of small cetaceans in the US purse-seine fishery for tuna in the eastern tropical Pacific during 1986. Rep. Int. Whal. Commn 38. (in press).
- Wexler, J.B. and C.W. Oliver. 1988. Pinniped research conducted at San Clemente Island during 1984. SWFC Admin. Rept. No. LJ-88-16.
- Yochem, P.K., B.S. Stewart, R.L. DeLong, and D.P. DeMaster. 1987. Diel haul-out patterns and site fidelity of harbor seals (*Phoca vitulina*) on San Miguel Island, CA, in autumn. Marine Mammal Sciences 3(4):323-332.

ADDRESS:

National Marine Fisheries Service
Northwest and Alaska Fisheries Center
National Marine Mammal Laboratory
7600 Sand Point Way N.E.
Seattle, Washington 98115

Antonelis, G.A. Jr., M.S. Lowry, Douglas P. DeMaster, and Clifford H. Fiscus. 1987. Assessing northern elephant seal feeding habits by stomach lavage. *Mar. Mammal Sci.* 3(4):308-322.

Baker, C. S., L. M. Herman, A. Perry, W. S. Lawton, J. M. Straley, A. A. Wolman, G. D. Kaufman, H. E. Winn, J. D. Hall, J. M. Reinke, and J. Ostman. 1986. Migratory movement and population structure of humpback whales (Megaptera novaeangliae) in the central and eastern North Pacific. *Mar. Ecol. Prog. Ser.* 31:105-119.

Barlough, J. E., E. S. Berry, E. A. Goodwin, R. F. Brown, R. L. DeLong, and A. W. Smith. 1987. Antibodies to marine caliciviruses in the Steller sea lion (Eumetopias jubatus Schreber). *J. Wildl. Dis.* 23(1):34-44.

Braham, H.W. 1986. An annotated bibliography of right whales, Eubalaena glacialis, in the North Pacific, In: R. L. Brownell, Jr., P. B. Best and J. H. Prescott, editors, Right whales: past and recent status, p. 65-77 [Rep. Int. Whaling Comm. (Special Issue) 10:65-77]. Cambridge University Press. Cambridge, U.K.

Braham, H.W. 1986. On estimating rates of gross reproduction and fishing mortality for bowhead whales. *Rep. Int. Whaling Comm.* 36(Annex H, App. 2):106-107.

Breiwick, J. M., and W. M. Marquette. 1987. [Review] Whales, Ice and Men. The history of whaling in western Arctic. *Mar. Mam. Sci.* 3(3):289-290.

John P. Croxall and Roger L. Gentry (editors). 1987. Status, biology, and ecology of fur seals. Proceedings of an international symposium and workshop. Cambridge, England, 23-27 April 1984. U.S. Department of Commerce. Washington. NOAA Tech. Rep. NMFS 51. 212 p.

Dahlheim, Marilyn E. 1987. The bio-acoustics of the gray whale (Eschrichtius robustus). PhD dissertation. University of British Columbia, Department of Zoology. 266 p.

- DeLong, Robert L. 1986. Northern elephant seal, In: Delphine Haley, editor, Marine mammals of eastern North Pacific and Arctic waters, 2d. ed., rev., p. 230-235. Pacific Search Press. Seattle, WA.
- Fowler, Charles W. 1986. Report of the workshop on the status of northern fur seals on the Pribilof Islands, Alaska, November 14-16, 1983. NWAFC Tech. Memo. NMFS F/NWC-97:1-5.
- Fowler, Charles W. 1987. Marine debris and northern fur seals: a case study. Mar. Pollut. Bull. 18(6B):326-335.
- Fowler, Charles W. 1987. A review of density dependence in populations of large mammals, In: Hugh H. Genoways, editor, Current Mammalogy, v. 1, p. 401-441. Plenum Publishing Corp. New York.
- Fowler, Charles W. and Theodore R. Merrell. 1986. Victims of plastic technology. [pinnipeds] Alaska Fish & Game 18(2):34-37.
- Gentry, R.L. and G.L. Kooyman (editors). 1986. Fur seals: maternal strategies on land and at sea. Princeton University Press. Princeton, NJ. 289 p.
- Gentry, Roger L. 1987. Seals and their kin. Natl. Geogr. 171(4):475-501.
- Gentry, Roger L., and David E. Withrow. 1986. Steller sea lion, In: Delphine Haley, editor, Marine mammals of eastern North Pacific and Arctic waters, 2d. ed., rev., p. 188-194. Pacific Search Press. Seattle, WA.
- Hacker, Elizabeth, and George A. Antonelis, Jr. 1986. Pelagic food habits of northern fur seals. NWAFC Processed Report 86-19:23-30.
- Heyning, J. and M. Dahlheim. 1987. The killer whale (Orcinus orca). Mammalian Species Account No. 305, p. 1-9. Am. Soc. Mammal. 9p.
- Huber, Harriet R. 1987. Natality and weaning success in relation to age of first reproduction in northern elephant seals. Can. J. Zool. 65(6):1311-1316.
- Jones, J. K., Jr., D. C. Carter, H.H. Genoways, R.S. Hoffmann, D.W. Rice, and C. Jones. 1986. Revised Checklist of North American Mammals North of Mexico, 1986. Occas. Papers, Mus., Texas Tech Univ. 107:1-22.

- Kozloff, P. (editor). 1986. Fur seal investigations, 1984, p. 16-22. U.S. Department of Commerce. Seattle, WA. NOAA Tech. Memo. NMFS F/NWC-97. 86 p.
- Loughlin, Thomas R., and Patricia A. Livingston (editors). 1986. Summary of joint research on diet of northern fur seals and fish in the Bering Sea during 1985. NWAFC Proc. Rep. 86-19. 92 p.
- Loughlin, Thomas R. and Russell Nelson, Jr. 1986. Incidental mortality of northern sea lions in Shelikof Strait, Alaska. Mar. Mammal Sci. 2(1):14-33.
- Loughlin, Thomas R. 1987. Report of the workshop on the status of northern sea lions in Alaska. NWAFC Proc. Rep. 87-04, 49 p.
- Loughlin, Thomas R., J.L. Bengtson and R.L. Merrick. 1987. Characteristics of feeding trips of female northern fur seals. Can. J. Zool. 65(8):2079-2084.
- Loughlin, Thomas R., Michael A. Perez and Richard L. Merrick. 1987. Eumetopias jubatus. Mammalian Species Account No. 283, p. 1-7. Am. Soc. Mammal. 7p.
- Merrick, Richard L. 1987. Behavioral and demographic characteristics of northern sea lion rookeries. MS thesis. University of Washington. 125 p.
- Merrick, Richard L., T.R. Loughlin and D.G. Calkins. 1987. Decline in abundance of the northern sea lion, Eumetopias jubatus, in Alaska, 1956-86. Natl. Mar. Fish. Serv. Fish. Bull. 85(2):351-365.
- Miller, R.V., D.J. Rugh and J.H. Johnson. 1986. The distribution of bowhead whales, Balaena mysticetus, in the Chukchi Sea. Mar. Mammal Sci. 2(3):214-222.
- Mizroch, Sally A. 1987. Humpback whales as individuals. Anim. Welfare Inst. Q. 36(4):18.
- Mizroch, Sally A. 1987. [Review] Marine Mammals of the Eastern North Pacific and Arctic Waters, edited by Delphine Haley. Cetus 7(2):31.
- Nerini, M.K. and D.J. Rugh. 1986. Distribution of bowhead whales in the vicinity of Point Barrow, Alaska: aerial observations 1984 and 1985. Rep. Int. Whaling Comm. 36:359-361.
- Perez, Michael A. 1986. Estimated total consumption of walleye pollock by northern fur seals in the eastern Bering Sea using diet composition data. NWAFC Proc. Rep. 86-19:31-38a.

- Perez, Michael A, and Michael A. Bigg. 1986. Diet of northern fur seals, Callorhinus ursinus, off western North America. Fish. Bull. 84(4):957-971.
- Perez, Michael A., and Thomas R. Loughlin. 1986. Relationships among marine mammals and gadoid fishes: A comparison between the Bering Sea and the North Sea, p. 357-392, Part I. In: M. Alton (compiler), Proceedings: A workshop on comparative biology, assessment, and management of the gadoids from the North Pacific and Alaska areas, NWAFC, Seattle, WA.
- Perez, Michael A., and Elizabeth E. Mooney. 1986. Increased food and energy consumption of lactating northern fur seals, Callorhinus ursinus. Fish. Bull. 84(2):371-381.
- Rice, Dale W. 1986. Beaked whales, In: Delphine Haley, editor, Marine mammals of eastern North Pacific and Arctic waters, 2d. ed., rev. p. 102-109. Pacific Search Press. Seattle, WA.
- Rice, Dale W. 1986. Blue whale, In: Delphine Haley, editor, Marine mammals of eastern North Pacific and Arctic waters, 2d. ed., rev., p. 40-45. Pacific Search Press. Seattle, WA.
- Rice, Dale W. 1986. Gray whale, In: Delphine Haley, editor, Marine mammals of eastern North Pacific and Arctic waters, 2d. ed., rev., p. 64-71. Pacific Search Press. Seattle, WA.
- Rice, Dale W. 1986. Sperm whales, In: Delphine Haley, editor, Marine mammals of eastern North Pacific and Arctic waters. 2d. ed., rev., p. 94-101. Pacific Search Press. Seattle, WA.
- Rice, Dale W., A.A. Wolman, B.R. Mate and J.T. Harvey. 1986. A mass stranding of sperm whales in Oregon: sex and age composition of the school. Mar. Mammal Sci. 2(1):64-69.
- Rice, Dale W. 1987. Platanista Wagler, 1830 (Mammalia, Cetacea): proposed conservation. Bull. Zool. Nomen. 44(4):253-254.
- Rice, Dale W. 1987. [Review] Right whales: past and present status, edited by R. L. Brownell, Jr., P. B. Best, and J. H. Prescott. Mar. Mam. Sci. 4(1):79-80.

- Sumich, James and James T. Harvey 1986. Juvenile mortality in gray whales (Eschrichtius robustus). J. Mammal. 67(1):179-182.
- Swartz, Steven L., M.L. Jones, J. Goodyear, D.E. Withrow, and R.V. Miller. 1987. Radio-telemetric studies of gray whale migration along the California coast: a preliminary comparison of day and night migration rates. Rep. Int. Whaling Comm. 37:295-299.
- Thomas, J. A., S. R. Fisher, Lisa M. Ferm, and R. Holt. 1986. Acoustic detection of cetaceans using a towed array of hydrophones. Rep. Int. Whaling Comm., Special Issue 8:139-148.
- Trivelpiece, W. Z., John L. Bengtson, S. g. Trivelpiece, and N. J. Volkman. 1986. Foraging behavior of gentoo and chinstrap penguins as determined by new radiotelemetry techniques. Auk 103:777-781.
- Wolman, Allen A. 1986. Humpback whale, In: Delphine Haley, editor, Marine mammals of eastern North Pacific and Arctic waters, 2d. ed., rev., p. 56-63. Pacific Search Press. Seattle, WA.
- Yochem, Pamela K., B.S. Stewart, R.L. DeLong, and D.P. DeMaster. 1987. Diel haul-out patterns and site fidelity of harbor seals (Phoca vitulina richardsi) on San Miguel Island, California, in autumn. Mar. Mammal Sci. 3(4):323-332.
- York, Anne E. and Patrick Kozloff. 1987. On the estimation of numbers of northern fur seal, Callorhinus ursinus, pups born on St. Paul Island, 1980-86. Fish. Bull. 8 (2):367-375.
- Zeh, Judith, Howard Braham, Douglas Chapman, Christopher Clark, Philip Hammond, Bruce Krogman, and Mary Nerini. 1986. Report of working group to develop a population estimate for the western stock of bowhead whales. Rep. Int. Whaling Comm. 36(Annex H, App 4):108-109.

